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# Lancaster County Test Hole Logs

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# **LANCASTER COUNTY Test-Hole Logs**

**Raymond R. Burchett and Frank A. Smith**

**Nebraska Water Survey  
Test-Hole Report No. 55**

**Conservation and Survey Division  
Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln**



**May 1990  
(Revised August 1992)**



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## INTRODUCTION

In 1930, the Conservation and Survey Division of the University of Nebraska and the U.S. Geological Survey began a program of cooperative groundwater studies in Nebraska. Since then test drilling by use of rotary drilling equipment has been an integral part of that program. This report contains logs of all the test holes drilled in the county under the program as well as those drilled by the Conservation and Survey Division with financial assistance from other government agencies.

The map in this report shows the location of all test holes drilled in the county since 1930.

Present techniques of test-hole logging and sampling include use of drilling mud suitable to drilling conditions, timing by stopwatch of the drilling of each 5-foot increment of depth, and removal of all cuttings from the test hole at intervals of 5 feet or less. During the drilling of the hole, cuttings from each interval are examined immediately; samples representing each 5-foot interval and each recognizable change in material are retained. After samples are washed, they are described lithologically and the color is evaluated by comparison with standard color charts. The samples then are dried, stored, and cataloged. Beginning in September 1951, the test holes have been logged electrically. All samples are processed and kept on open file in the offices of Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588.

This publication is one of a series being issued to make more readily available the record of test holes drilled since 1930. The series of publications is made on a county basis and includes, with some exceptions, logs of all test holes drilled in each of the counties. The logs have not been reviewed for conformance with editorial standards and nomenclature.

The method whereby the altitude of the land surface at test-hole sites was determined is indicated in the heading of each log, as follows: a = altimeter, h = hand leveling, i = spirit leveling, t = estimated from topographic map.

The test-hole records accurately reflect subsurface conditions only at the locations where the test holes were drilled. Interpretive data reflecting probable subsurface conditions between test-holes are being compiled for publication in county reports and are available for inspection in the office of the Conservation and Survey Division.

Each test hole is identified by a number assigned in the field (for example #3-B-67, #41-79), and most are also identified by a number indicating its location within the land divisions of the U.S. Bureau of Land Management's survey of Nebraska. Location numbers of test holes east of the 6th principal meridian, which passes through Columbus in a north-south direction, are preceded by the capital letter A; those west of the principal meridian have no preceding letter. The first numeral indicates the township, the second the range, and the third the section. As shown in figure 1, the letters that follow the section number indicate the location of the test hole within the section, the first letter indicating the quarter section and the second letter indicating the quarter-quarter section. The letters A, B, C, and D are applied in counterclockwise direction beginning with A in the northeast quadrant. The last numeral is the serial number of the test hole within the quarter-quarter section. No number is shown unless more than one test hole is within the given quarter-quarter section.

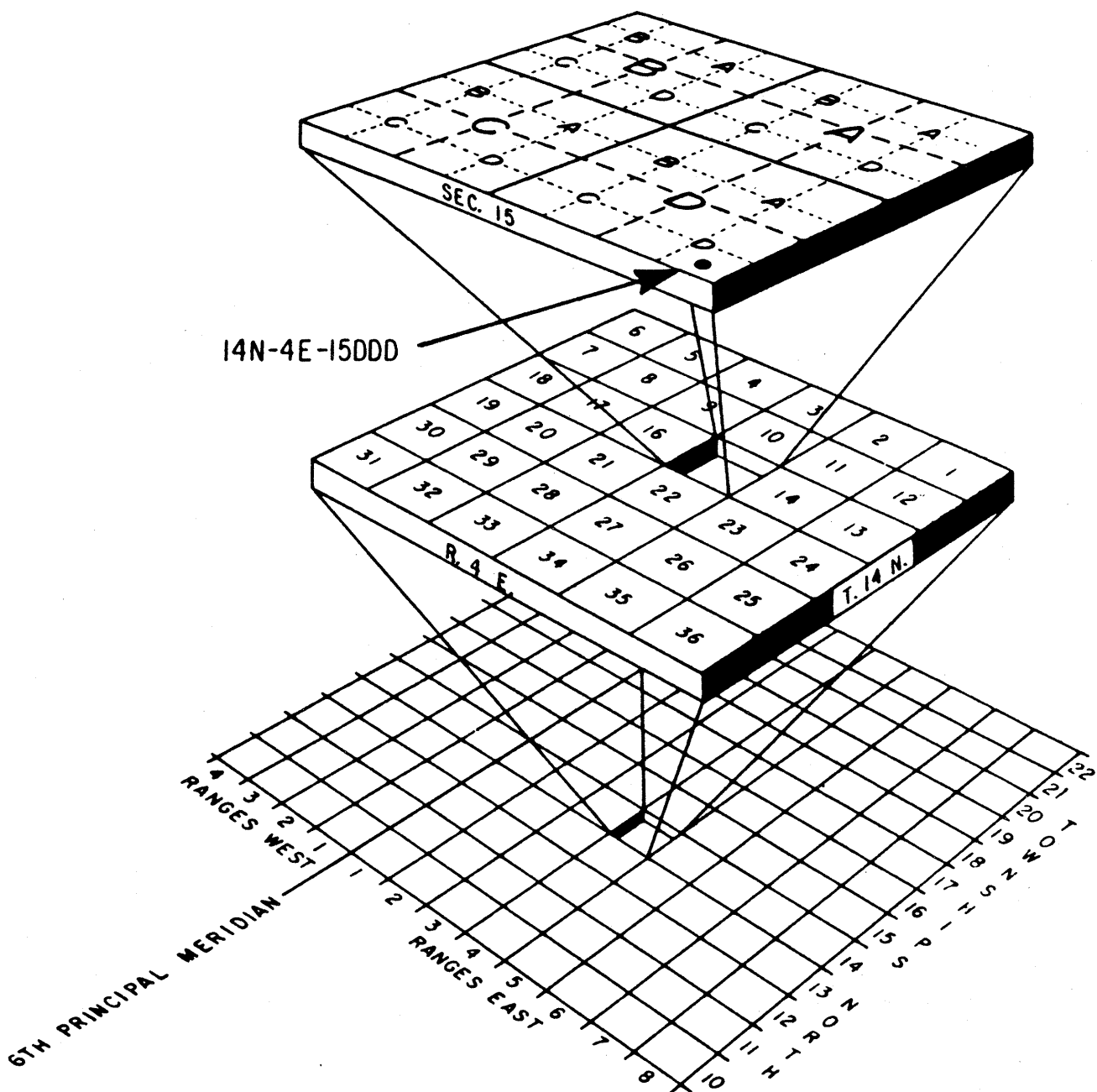


Fig. 1. System for identifying test-holes according to their location.

LANCASTER COUNTY

Legal description			Test-hole number		Page	Legal description			Test-hole number		Page
Twp	Rge	Sec				Twp	Rge	Sec			
07N	05E	03	01-B-48		1	09N	06E	11	43-1		49
07N	05E	14	04-B-45		2	09N	06E	11	43-3		50
07N	05E	27	05-B-45		3	09N	06E	11	43-4		51
07N	05E	31	06-B-45		4	09N	06E	11	43-5		52
07N	06E	03	20-B-44		5	09N	07E	12	01-B-49		53
07N	06E	08	03-B-45		6	09N	08E	30	13-B-49		54
07N	07E	26	22-B-44		7	10N	05E	11	01-A-48		56
07N	08E	04	24-B-44		8	10N	05E	22	59-A-51		58
07N	08E	18	23-B-44		9	10N	05E	34	04-B-48		59
07N	08E	31	70-A-49		10	10N	06E	05	01-A-50		60
08N	05E	07	05-A-63		11	10N	06E	13	01-B-50		61
08N	05E	14	02-B-48		13	10N	06E	13	12-A-50		62
08N	05E	27	21-B-44		14	10N	06E	13	13-A-50		63
08N	06E	01	55-A-51		15	10N	06E	13	60-A-51		64
08N	06E	19	02-B-45		16	10N	06E	14	61-A-51		65
08N	06E	26	50-B-45		17	10N	06E	22	02-A-49		66
08N	06E	27	57-A-51		18	10N	06E	23	01-B-86		67
08N	06E	34	05-A-54		19	10N	06E	23	01-A-49		68
08N	07E	16	12-B-49		20	10N	06E	23	02-A-50		70
08N	07E	18	04-A-54		24	10N	06E	34	62-A-51		71
08N	07E	20	03-A-54		25	10N	06E	35	03-B-49		72
08N	07E	21	02-A-54		26	10N	06E	35	04-B-49		74
08N	07E	25	10-B-49		27	10N	07E	01	08-B-49		76
08N	07E	30	01-A-54		28	10N	07E	03	21-B-46		78
08N	07E	33	56-A-51		29	10N	07E	04	22-B-46		79
08N	08E	07	02-B-49		30	10N	07E	04	07-A-73		80
08N	08E	22	8GT-80		32	10N	07E	05	03-A-51		81
08N	08E	26	25-B-44		35	10N	07E	05	14-A-50		82
08N	08E	31	11-B-49		36	10N	07E	05	02-A-51		83
09N	05E	22	03-B-48		37	10N	07E	05	04-A-73		84
09N	05E	34	19-B-46		38	10N	07E	05	06-A-73		85
09N	06E	02	02-43		39	10N	07E	06	08-A-73		86
09N	06E	02	03-43		40	10N	07E	10	20-B-46		87
09N	06E	02	05-43		41	10N	07E	12	06-B-49		88
09N	06E	02	06-43		42	10N	07E	18	01-A-59		89
09N	06E	02	07-43		43	10N	07E	18	01-B-91		91
09N	06E	04	01-L-39		44	10N	07E	21	01-A-51		93
09N	06E	05	58-A-51		45	10N	07E	25	05-B-49		95
09N	06E	06	01-U-42		46	10N	08E	12	01-A-57		97
09N	06E	11	01-43		47	11N	05E	03	02-A-48		99
09N	06E	11	04-43		48	11N	05E	11	05-B-48		100

Legal description			Test-hole number	Page	Legal description			Test-hole number	Page
Twp	Rge	Sec			Twp	Rge	Sec		
11N	05E	25	01-B-42	102	11N	08E	05	31-B-46	120
11N	05E	26	01-B-45	103	11N	08E	05	32-B-46	121
11N	05E	30	01-A-44	105	11N	08E	09	29-B-46	123
11N	06E	06	51-A-51	106	11N	08E	09	30-B-46	124
11N	06E	20	63-A-51	107	11N	08E	14	28-B-46	125
11N	06E	31	52-A-51	108	11N	08E	15	26-B-46	126
11N	06E	35	34-B-46	109	11N	08E	15	27-B-46	127
11N	07E	29	25-B-46	111	11N	08E	18	09-B-49	129
11N	07E	30	53-A-51	112	11N	08E	31	07-B-49	130
11N	07E	32	24-B-46	113	11N	08E	35	01-A-68	131
11N	07E	32	01-A-73	114	12N	05E	03	06-B-48	133
11N	07E	32	02-A-73	115	12N	05E	22	03-A-48	134
11N	07E	32	03-A-73	116	12N	07E	36	33-B-46	135
11N	07E	32	05-A-73	117	12N	08E	06	72-A-49	137
11N	07E	33	23-B-46	118	12N	08E	18	71-A-49	138
11N	07E	35	54-A-51	119					

Test-hole logs are arranged in this publication by township, range and section.



Test Hole #1-B-48  
(A7-5-3dc)  
Lancaster County

Location: SW SW SW SE sec. 3, T. 7 N., R. 5 E., approximately 13 feet north and 2,469 feet west of the southeast corner.  
Ground elevation: 1,375.0 ft. (t). (Hallam 7.5 min. quadrangle)  
Depth to water: 46.0 ft. (5-13-48).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.5
Clay, silty, brownish buff, reddish brown below 2.5 ft.....	1.5	8.0
Clay, silty, reddish brown, light brown with red tint below 9.5 ft; contains some limonitic stain..	8.0	14.5
Silt, slightly clayey, slightly sandy, light brown; sand is very fine.....	14.5	19.5
Sand, silty, to sandy silt; sand is very fine to medium with some coarse.....	19.5	23.5
Sand and gravel, medium sand to fine gravel with some medium gravel; contains a few greenish gray clay granules.....	23.5	34.5
Sand, silty, to sandy silt; sand is fine to coarse..	34.5	40.5
Sand and gravel, slightly silty; medium sand to fine gravel.....	40.5	43.0
Clay, silty, light gray; contains a few limy nodules and shell fragments; contains a yellow tint below 48 ft.....	43.0	51.5
Silt, dark gray to light gray with bluish green tint	51.5	55.0
Silt, sandy, dark gray; sand is very fine to fine, light gray with limonitic stain below 57.5 ft; contains no sand.....	55.0	58.0
Sand and gravel, medium sand to fine gravel with some medium gravel.....	58.0	60.0
Till, clay, sandy to gravelly, yellow brown, dark gray below 63 ft; contains some limy fragments....	60.0	81.0
Sand, fine to coarse, with a trace of fine gravel...	81.0	83.0
Till, clay, sandy to gravelly, dark gray; contains some interbedded sand and gravel lenses.....	83.0	105.0
Sand and gravel, fine sand to fine gravel with some medium gravel; contains a few pelecypod shells from 205 to 210 ft; slightly coarser grained below 255 ft.....	105.0	263.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, in part silty; sand is very fine to fine; slightly coarser; contains some ironstone below 275 ft.....	263.0	289.0
Permian System - Big Blue Series - Council Grove Group:		
Limestone, light gray.....	289.0	290.0

Test Hole #4-B-45  
(A7-5-14dd)  
Lancaster County

Location: SE SE SE sec. 14, T. 7 N., R. 5 E., approximately 8 feet north and 225 feet west of the southeast corner.  
Ground elevation: 1,409.0 ft. (a). (Hallam 7.5 min. quadrangle)  
Depth to water: 27.3 ft. (7-28-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	2.0
Till, clay, calcareous, sandy to gravelly, light gray to brownish gray; contains some yellowish brown below 15 ft.....	2.0	45.0
Silt, slightly clayey, calcareous, yellowish brown, micaceous.....	45.0	55.0
Till, clay, calcareous, sandy to gravelly, brownish gray.....	55.0	60.0
Sand, fine to medium; sand is fine to coarse from 75 to 80 ft.....	60.0	95.0
Silt, moderately clayey, slightly sandy, slightly calcareous, medium gray; sand is very fine to fine.....	95.0	120.0
Till, clay, calcareous, sandy to gravelly, medium gray, very gravelly below 140 ft; contains much concretionary limy nodules below 145 ft.....	120.0	150.0
Sand, fine to medium with some coarse.....	150.0	170.0
Sand, fine to coarse; contains some fine gravel below 177 ft; contains slightly less gravel below 190 ft.....	170.0	220.0
Sand, fine to coarse; sand is fine to very coarse with some fine gravel below 235 ft.....	220.0	255.0
Sand, fine to coarse with some very coarse.....	225.0	260.0
Sand and gravel, fine sand to fine gravel (60 percent gravel).....	260.0	270.0
Silt, slightly clayey, moderately calcareous, light gray.....	270.0	287.0
Clay, silty, dark gray, in part carbonaceous.....	287.0	289.5
Sand, fine to coarse with some fine gravel; contains much fine to coarse gravel below 300 ft.....	289.5	308.0
Permian System - Big Blue Series - Council Grove Group:		
Shale, light gray, clayey, silty.....	308.0	312.0
Limestone, light gray.....	312.0	312.5
Shale, dark gray, moderately calcareous.....	312.5	314.5
Limestone, gray.....	314.5	315.0

Test Hole #5-B-45  
(A7-5-27bb)  
Lancaster County

Location: SW NW NW sec. 27, T. 7 N., R. 5 E., approximately 1,200 feet south and 20 feet east of the northwest corner.  
Ground elevation: 1,473.0 ft. (t). (Hallam 7.5 min. quadrangle)  
Depth to water: Unknown; test hole caved at 142.0 ft. (8-2-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, clay, silty, dark brownish gray.....	0.0	1.0
Clay, silty, dark reddish brown, light reddish brown below 3 ft.....	1.0	5.0
Till, clay, sandy to pebbly, slightly calcareous, gray to light brown; contains many limestone pebbles below 7 ft; slightly darker in color below 30 ft.....	5.0	97.0
Gravel, fine to medium.....	97.0	100.0
Till, clay, sandy to pebbly, calcareous, brownish gray.....	100.0	124.5
Sand, fine to medium; sand is fine to coarse below 130 ft.....	124.5	160.0
Sand and gravel, fine sand to fine gravel with a little medium gravel (50 percent gravel); contains 30 percent gravel below 165 ft. ....	160.0	180.0
Sand, fine to medium; sand is fine to coarse from 195 to 210 ft.....	180.0	225.0
Silt, slightly clayey, light gray.....	225.0	230.0
Sand, fine to medium; contains interbedded silt lenses from 235 to 240 ft.....	230.0	255.0
Sand, fine to coarse with some fine gravel; contains some medium to coarse gravel (30 percent gravel) below 260 ft.....	255.0	264.0
Silt, slightly clayey, gray to greenish gray.....	274.0	270.0
Till, clay, silty, calcareous, sandy to slightly gravelly, medium gray.....	270.0	300.0
Clay, silty, dark gray, in part carbonaceous grains.....	300.0	310.0
Gravel, fine, composed of shale and ironstone	310.0	311.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, varicolored red, light gray, and white, clayey.....	311.0	320.0



Test Hole #6-B-45  
(A7-5-31da)  
Lancaster County

Location: SE NE SE sec. 31, T. 7 N., R. 5 E., approximately 1,840 feet north and 6 feet west of the southeast corner.  
Ground elevation: 1,479.0 ft. (a). (Crete South 7.5 min. quadrangle)  
Depth to water: 81.5 ft. (8-4-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, clay, silty, brown.....	0.0	2.0
Clay, silty, brownish gray; light grayish brown; contains a few limonitic fragments below 5 ft.....	2.0	10.0
Clay, silty, reddish brown.....	10.0	14.0
Till, clay, sandy to gravelly, gray to light brown; medium gray to dark gray below 85 ft.....	14.0	92.0
Sand and gravel, fine sand to medium gravel.....	92.0	100.0
Sand, fine.....	100.0	108.0
Till, clay, sandy to gravelly, medium gray; contains some thin sand lenses below 205 ft.....	108.0	216.0
Sand, fine to coarse; contains some fine gravel below 230 ft.....	216.0	247.0
Silt, slightly clayey, in part sandy, gray; sand is fine with a few coarser grains.....	247.0	255.0
Silt, slightly clayey, medium gray; contains some wood fragments from 265 to 270 ft.....	255.0	292.0
Till, clayey, sandy to gravelly, calcareous, medium gray; contains some carbonaceous material from 315 to 320 ft.....	292.0	325.0
Silt, slightly clayey, sandy, slightly calcareous, dark brownish gray; sand is fine.....	325.0	336.0
Clay, silty, sandy to gravelly, dark brown with some light gray; contains medium sand to fine gravel composed of ironstone, sandstone, and limestone fragments.....	336.0	338.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, red to grayish white, clayey.....	338.0	350.0

Test Hole #20-B-44  
(A7-6-3bb)  
Lancaster County

Location: NW corner sec. 3, T. 7 N., R. 6 E., approximately 6 feet south and 86 feet east of the northwest corner.  
Ground elevation: 1,340.0 ft. (a). (Cortland 7.5 min. quadrangle)  
Depth to water: 15.5 ft. (8-10-44).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Silt, slightly clayey, sandy, reddish brown; sand is very fine to fine with a few coarse grains.....	2.0	5.0
Sand, silty, slightly clayey; sand is very fine to coarse with some very coarse; contains limestone nodules, limonitic fragments, and some fine gravel grains.....	5.0	20.0
Sand, very fine to coarse with some very coarse; contains some interbedded light gray silty clay layers.....	20.0	33.5
Till, clay, calcareous, sandy to gravelly, bluish gray.....	33.5	36.0
Sand, very fine to medium with a trace of coarser material.....	36.0	44.0
Till, clay, sandy to gravelly, calcareous, bluish gray; contains some thin gravel zones from 60 to 80 ft.....	44.0	113.0
Till, clay, very sandy to very gravelly, bluish gray; contains possible gravel layers.....	113.0	125.0
Sand and gravel, medium sand to fine gravel with some medium gravel (60 percent gravel); contains mostly coarse sand with some fine gravel from 130 to 135 ft; contains 50 percent gravel below 135 ft.....	125.0	140.5
Till, clay, calcareous, sandy to gravelly, bluish gray.....	140.5	155.0
Sand, fine to very coarse with some fine gravel.....	155.0	169.0
Silt, slightly clayey, calcareous, bluish gray; contains some limestone fragments.....	169.0	185.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, fine.....	185.5	190.0
Shale, olive gray to light blue, clayey.....	190.0	193.0
Permian System - Big Blue Series - Council Grove Group:		
Limestone, gray to pink.....	193.0	194.0

Test Hole #3-B-45  
(A7-6-8bc)  
Lancaster County

Location: NW SW NW sec. 8, T. 7 N., R. 6 E., approximately 1,990 feet south and 12 feet east of the northwest corner.  
Ground elevation: 1,389.0 ft. (t). (Hallam 7.5 min. quadrangle)  
Depth to water: 25.7 ft. (7-26-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray.....	0.0	2.0
Soil, clay, silty, dark gray.....	2.0	3.0
Clay, silty, brownish gray; light brown below 5 ft..	3.0	7.0
Clay, silty, sandy, reddish brown; brown below 9 ft.	7.0	10.0
Till, clay, calcareous, sandy to gravelly, light grayish brown; light yellowish gray with some brownish yellow from 35 to 55 ft; medium to dark gray below 55 ft.....	10.0	81.0
Sand, fine to very coarse with some fine gravel (about 10 percent gravel).....	81.0	90.0
Sand, fine.....	90.0	107.0
Silt, slightly clayey, medium gray.....	107.0	110.0
Silt, slightly clayey, sandy, brownish gray; sand is fine.....	110.0	120.0
Sand, fine to medium; sand is very fine to medium below 130 ft.....	120.0	140.0
Sand, very fine to fine with a trace of medium; sand is very fine to medium with a trace of coarse from 150 to 160 ft; sand is very fine to coarse below 160 ft.....	140.0	182.0
Till, clay, sandy to gravelly, calcareous, brownish gray; contains some interbedded silty sand lenses.	182.0	200.0
Sand, fine to coarse with some fine gravel.....	200.0	206.0
Silt, slightly clayey, very sandy, brownish gray....	206.0	211.0
Sand, fine to coarse; contains a few silty clay layers.....	211.0	222.0
Till, clay, sandy to gravelly, calcareous, dark gray; contains slightly more gravel below 245 ft..	222.0	263.0
Permian System - Big Blue Series - Council Grove Group:		
Shale, brown to dark gray, clayey, micaceous.....	263.0	264.0
Limestone, light gray.....	264.0	264.5
Shale, dark gray to black.....	264.5	266.5
Limestone, medium gray to dark gray.....	266.5	266.7

Test Hole #22-B-44  
(A7-7-26ba)  
Lancaster County

Location: NW NE NW sec. 26, T. 7 N., R. 7 E., approximately 6 feet south and 1,350 feet east of the northwest corner.  
Ground elevation: 1,361.0 ft. (a). (Firth 7.5 min. quadrangle)  
Depth to water: 6.2 ft. (8-12-44).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.5
Silt, moderately clayey, dark brownish gray.....	2.5	10.0
Clay, silty, mottled light gray to pale brown; contains some manganese concretions from 10 to 14 ft.	10.0	20.0
Silt, slightly clayey, moderately sandy, slightly calcareous, light yellow gray; sand is very fine to fine.....	20.0	29.0
Till, clay, calcareous, sandy to gravelly, yellow brown with some bluish gray; contains a sandy silt layer below 35 ft.....	29.0	43.0
Till, clay, sandy to gravelly, calcareous, bluish gray.....	43.0	63.0
Sand, fine to medium with some fine gravel (15 percent gravel); contains limestone fragments and dark silicates.....	63.0	68.0
Till, clay, calcareous, bluish gray.....	68.0	82.0
Sand, very fine to medium with some coarser grains..	82.0	95.0
Sand and gravel, heterogeneous; slightly coarser; contains many shale grains and limestone fragments below 110 ft.....	95.0	123.0
Till, clay, sandy to gravelly, calcareous, gray.....	123.0	147.0
Sand, very fine to coarse with some fine gravel.....	147.0	155.0
Sand, very fine to coarse; sand is very fine to medium with some coarse from 170 to 175 ft.....	155.0	240.0
Sand and gravel, fine sand to fine gravel (60 percent gravel).....	240.0	260.0
Sand, very fine to very coarse.....	260.0	270.0
Sand, very fine to medium with some coarse; contains no coarse sand from 275 to 285 ft; contains a little coarse sand below 295 ft.....	270.0	306.5
Sand and gravel, fine sand to fine gravel (60 percent gravel).....	306.5	315.0
Sand and gravel, coarse sand to coarse gravel; mostly shale and limestone fragments.....	315.0	326.0
Permian System - Big Blue Series - Admire Group:		
Limestone, light gray.....	326.0	327.0

Test Hole #24-B-44  
(A7-8-4ad)  
Lancaster County

Location: NE SE NE sec. 4, T. 7 N., R. 8 E., approximately 1,600 feet south and 7 feet west of the northeast corner.  
Ground elevation: 1,411.0 ft. (a). (Firth 7.5 min. quadrangle)  
Depth to water: 12.0 ft. (8-21-44).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Silt, moderately clayey, brown; contains some iron stain.....	2.0	5.0
Silt, moderately clayey, light brown to gray; contains some iron stain and limy nodules.....	5.0	10.0
Silt, slightly clayey, pale brown; contains iron stain.....	10.0	14.0
Silt, moderately clayey, light gray.....	14.0	20.0
Till, clay, sandy to gravelly, calcareous, light gray.....	20.0	27.5
Till, clay, sandy to gravelly, calcareous, pale yellow; slightly darker color below 35.5 ft.....	27.5	45.0
Till, clay, sandy to gravelly, calcareous, light gray; contains much gravel below 70 ft.....	45.0	76.0
Till, clay, sandy to gravelly, calcareous, light gray to brownish yellow; pale yellow with some light gray below 85 ft.....	76.0	88.0
Till, clay, sandy to gravelly, calcareous, dark gray with some olive gray.....	88.0	97.5
Silt, slightly clayey, sandy, calcareous, light brownish gray; sand is very fine to fine.....	97.5	140.0
Silt, slightly clayey, sandy, brownish gray; sand is very fine to fine.....	140.0	145.0
Till, clay, sandy to gravelly, calcareous, brownish gray with some bluish gray.....	145.0	172.5
Silt, moderately clayey, calcareous, bluish gray....	172.5	173.5
Silt, moderately clayey, sandy, calcareous, light olive gray; sand is very fine to fine with some medium to coarse.....	173.5	180.0
Sand, fine to coarse.....	180.0	188.5
Permian System - Big Blue Series - Council Grove Group:		
Limestone, pink and light gray.....	188.5	189.0

Test Hole #23-B-44  
(A7-8-18aa)  
Lancaster County

Location: NE NE NE sec. 18, T. 7 N., R. 8 E., approximately 5 feet south and 396 feet west of the northeast corner.  
Ground elevation: 1,341.0 ft. (t). (Firth 7.5 min. quadrangle)  
Depth to water: 13.2 ft. (8-16-44).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	3.5
Clay, silty, in part till-like, light yellow brown..	3.5	5.0
Till, clay, sandy to gravelly, calcareous, light gray.....	5.0	36.5
Till, clay, sandy to gravelly, calcareous, bluish gray; contains much gravel from 50 to 65 ft; very sandy to gravelly below 65 ft.....	36.5	75.0
Sand, very fine to coarse.....	75.0	87.5
Till, clay, sandy to gravelly, calcareous, bluish gray.....	87.5	95.0
Sand and gravel, fine sand to fine gravel; heterogeneous (70 percent gravel).....	95.0	100.0
Sand, very fine to coarse with some very coarse; heterogeneous.....	100.0	110.0
Silt, slightly clayey, calcareous, micaceous, greenish gray; contains some limy pebbles.....	110.0	115.0
Sand, fine to coarse; sand is fine to medium with a little coarse below 120 ft.....	115.0	157.5
Silt, moderately clayey, calcareous, micaceous, light bluish gray; slightly darker below 160 ft...	157.5	167.0
Sand, very fine to medium; contains about 15 percent gravel from 169 to 175 ft.....	167.0	180.0
Sand, very fine to fine with a little medium; sand is very fine to medium below 215 ft.....	180.0	224.5
Silt, moderately clayey, calcareous, greenish gray..	224.5	230.5
Sand and gravel, coarse sand to fine gravel; heterogeneous.....	230.5	235.0
Silt, moderately clayey, calcareous, light gray; contains bryozoa and crinoid stem fragments.....	235.0	240.0
Permian System - Big Blue Series - Admire Group:		
Limestone, pink.....	240.0	240.7
Shale, black; carbonaceous.....	240.7	242.4
Limestone, light gray.....	242.4	243.0

Test Hole #70-A-49  
(A7-8-31bb)  
Lancaster County

Location: NW NW NW sec. 31, T. 7 N., R. 8 E., approximately 305 feet south and 11 feet east of the northwest corner.  
Ground elevation: 1,395.0 ft. (t). (Firth 7.5 min. quadrangle)  
Depth to water: 11.8 ft. (11-29-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	1.5
Soil, silt, black; granular.....	1.5	3.5
Soil, silt, clayey, dark brown; granular.....	3.5	4.0
Clay, silty, grayish brown.....	4.0	5.0
Silt, slightly clayey, slightly calcareous, grayish brown with greenish tint; contains some iron stain	5.0	10.5
Silt, moderately clayey, dark brown with reddish tint; granular.....	10.5	16.0
Silt, clayey, slightly sandy, medium gray; sand is very fine to medium; light gray below 20 ft; slightly calcareous from 20 to 25 ft; moderately calcareous below 25 ft; contains some iron stain below 30 ft.....	16.0	32.5
Till, clay, sandy to gravelly, calcareous, gray to yellow brown; at 43.5 ft. contains a sandy lens; light yellowish brown below 47 ft.....	32.5	63.0
Till, clay, sandy to gravelly, calcareous, dark bluish gray; contains a sand lens from 91.5 to 92 ft; light bluish gray below 110 ft.....	63.0	126.5
Sand, very fine to coarse; contains calcareous fragments.....	126.5	128.0
Till, clay, sandy to gravelly, calcareous, light bluish gray.....	128.0	140.0
Sand, very fine to very coarse; contains some light gray, interbedded sandy silt layers; contains some fine gravel below 150 ft.....	140.0	160.0
Sand, very fine to fine.....	160.0	170.0
Sand, very fine to medium; sand is very fine to very coarse below 190 ft; contains a trace of fine gravel below 230 ft; contains a silty clay layer from 248 to 249 ft.....	170.0	250.0
Sand, very fine to very coarse with some fine gravel	250.0	290.0
Sand and gravel, very fine sand to fine gravel (60 percent gravel).....	290.0	319.5
Silt, slightly clayey, very sandy, light brown; sand is very fine.....	319.5	320.5
Sand and gravel, very fine sand to medium gravel (40 percent gravel).....	320.5	347.0
Silt, slightly clayey, sandy, light brown; sand is very fine to fine.....	347.0	372.5
Sand, very fine to coarse with some limy fragments..	362.5	380.0
Permian System - Big Blue Series - Admire Group:		
Limestone and shale, interbedded, light gray.....	380.0	389.0

Test Hole #5-A-63  
(8-5-7bb)  
Lancaster County

Location: SW NW NW sec. 7, T. 8 N., R. 5 E., approximately 718 feet south and 10 feet east of the northwest corner.  
Ground elevation: 1,468.0 ft. (t). (Crete North 7.5 min. quadrangle)  
Depth to water: 26.48 ft. (7-3-63).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, black.....	0.0	2.3
Silt, moderately clayey, light yellowish brown.....	2.3	7.0
Silt, moderately clayey, yellowish brown.....	7.0	15.0
Silt, moderately clayey, sandy, brownish gray to black; sand is very fine.....	15.0	16.8
Silt, moderately clayey, light gray; some very fine sand to 20 ft; light yellowish brown with some pale brown below 20 ft.....	16.8	25.0
Silt, slightly clayey, slightly sandy, light gray; sand increases with depth below 30.0 ft.....	25.0	36.0
Till, clay, silty, sandy, pebbly, moderately calcareous, light gray.....	36.0	67.3
Sand and gravel, coarse sand to fine gravel.....	67.3	68.0
Till, clayey, moderately calcareous, dark bluish gray; some limestone fragments below 70.0 ft; sandy to gravelly below 80 ft.....	68.0	110.0
Till, clayey, moderately calcareous, very dark gray; sandy below 118.0 ft; sandy and gravelly below 124.0 ft.....	110.0	150.0
Till, clayey, moderately calcareous, very dark gray. Sand and gravel; fine sand to fine gravel; some wood fragments below 170.0 ft.....	150.0	169.0
Till, clayey, silty, sandy, moderately calcareous, very dark gray.....	169.0	175.0
Sand and gravel, fine sand to fine gravel; some till	175.0	190.0
Till, silt with interbedded sand lenses.....	190.0	195.0
Sand, fine to very fine; medium to very fine below 220.0 ft; few interbedded silt lenses.....	195.0	205.0
Silt, moderately clayey, gray.....	205.0	235.5
Sand, very fine to fine, interbedded with silt.....	235.5	240.0
Silt, clayey, some very fine sand.....	240.0	250.0
Sand, very fine to fine; few silt lenses.....	250.0	255.0
Silt, moderately clayey, sandy, moderately calcareous, dark gray; sand is very fine; interbedded sand lens from 269.5 to 269.7 and from 269.9 to 270.0 ft.....	255.0	260.0
Sand, very fine; some thin silt lenses.....	260.0	275.0
Silt, moderately clayey, moderately calcareous, dark gray; olive gray from 300.0 to 302.5 ft.....	275.0	284.0
	284.0	307.5



Silt, slightly clayey, light gray; some ironstone below 310.0 ft.....	307.5	315.0
Sand and gravel, coarse sand to very coarse gravel, much ironstone fragments.....	315.0	318.3
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, mottled red and gray, clayey, mottled red and yellow from 320.0 to 325.0 ft; yellowish brown to gray below 325.0 ft.....	318.3	334.0
Shale, mottled red and gray; clayey, very light gray below 335.0 ft.....	334.0	340.0

Test Hole #2-B-48  
(A8-5-14bb)  
Lancaster County

Location: NW corner sec. 14, T. 8 N., R. 5 E., approximately 120 feet south and 7 feet east of the northwest corner.  
Ground elevation: 1,455.0 ft. (t). (Denton 7.5 min. quadrangle)  
Depth to water: 18.6 ft. (5-19-48).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil.....	0.0	0.5
Clay, silty, medium brown with grayish tint.....	0.5	2.0
Silt, clayey, medium brown; contains a few calcareous nodules.....	2.0	3.0
Silt, slightly clayey, brown; contains iron stain and limy nodules; light gray below 7.5 ft.....	3.0	12.5
Clay, silty, brown; light brown below 13 ft.....	12.5	15.0
Till, clay, sandy to gravelly, slightly calcareous, yellow brown; contains some limy pebbles.....	15.0	40.0
Till, clay, sandy to gravelly, slightly calcareous, light grayish yellow to yellowish brown.....	40.0	98.0
Sand and gravel, coarse sand to coarse gravel; contains much reworked material.....	98.0	106.5
Till, silt, clayey, sandy to gravelly, slightly calcareous, yellowish brown; dark gray below 110 ft; moderately calcareous below 120 ft.....	106.5	125.0
Sand, fine to coarse; sand is fine to medium with some coarse from 130 to 140 ft; contains some fine to medium gravel below 140 ft.....	125.0	152.5
Till, silt, clayey, slightly sandy to slightly gravelly, dark gray; contains some limy nodules...	152.5	155.0
Silt, slightly clayey, slightly sandy, slightly calcareous light gray with bluish green tint; sand is very fine.....	155.0	162.5
Silt, slightly clayey, slightly calcareous, light gray with bluish green tint.....	162.5	165.0
Sand, fine to medium with some coarse.....	165.0	172.0
Silt, slightly clayey, slightly calcareous, light gray with brown tint.....	172.0	180.0
Clay, silty, sandy, slightly calcareous, light brownish gray; sand is fine to coarse with some coarser grains; light gray with brownish tint below 190 ft.....	180.0	255.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is fine to medium with some coarse..	255.5	260.0
Silt, yellowish brown, slightly clayey, slightly sandy; sand is very fine; light gray from 260 to 266 ft; contains some interbedded reddish clay from 266 to 275 ft.....	260.0	280.0
Sandstone, very fine-grained; contains some interbedded siltstone below 285 ft.....	280.0	290.0
Siltstone, light brownish gray, sandy; contains some interbedded ironstone layers.....	290.0	300.0

Test Hole #21-B-44  
(A8-5-27dd)  
Lancaster County

Location: NE SE SE sec. 27, T. 8 N., R. 5 E., approximately 750 feet north and 6 feet west of the southeast corner.  
Ground elevation: 1,456.0 ft. (a). (Denton 7.5 min. quadrangle)  
Depth of water: 49.0 ft. (8-10-44).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Clay, silty, brown.....	2.0	13.0
Clay, silty, reddish brown.....	13.0	18.0
Till, clay, sandy to gravelly, calcareous, yellowish brown; contains a thin gravel layer from 68 to 70 ft.....	18.0	83.0
Till, clay, sandy to gravelly, calcareous, bluish gray; contains shell fragments from 130 to 135 ft.	83.0	160.0
Sand, fine to medium; contains some shell fragments below 165 ft.....	160.0	170.0
Sand, fine to coarse.....	170.0	185.0
Sand, fine to coarse with some fine gravel; contains some black shaly pebbles and limonitic fragments below 195 ft.....	185.0	210.0
Sand, medium to coarse with some fine gravel; at 216 ft. contains light gray clay lens; contains 30 percent gravel from 260 to 280 ft; sand is fine to coarse below 175 ft; contains 20 percent gravel from 280 to 290 ft; contains 10 percent gravel below 290 ft.....	210.0	300.0
Gravel, fine to medium.....	300.0	310.0
Sand, fine to coarse with some gravel (30 percent gravel).....	310.0	320.0
Sand and gravel, fine sand to fine gravel (60 percent gravel).....	320.0	323.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone and ironstone.....	323.5	324.5
Shale, light gray, clayey.....	324.5	332/5
Sandstone, well consolidated; sand is fine to medium	332.5	342.0

Test Hole #55-A-51  
(A8-6-1aa)  
Lancaster County

Location: NW NE NE sec. 1, T. 8 N., R. 6 E., approximately 45 feet  
south and 1,000 feet west of the northeast corner.  
Ground elevation: 1,197.0 ft. (a). (Roca 7.5 min. quadrangle)  
Depth to water: 9.8 ft. (11-28-51).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, granular, dark brown.....	0.0	2.5
Silt, slightly clayey, dark brown; slightly lighter in color below 4 ft.....	2.5	5.0
Silt, moderately clayey, yellowish brown.....	5.0	18.0
Silt, slightly clayey, slightly sandy, reddish brown; sand is very fine to medium.....	18.0	20.0
Sand, fine to coarse with a trace of very coarse....	20.0	21.5

Test Hole #2-B-45  
(A8-6-19dd)  
Lancaster County

Location: NE SE SE sec. 19, T. 8 N., R. 6 E., approximately  
1,050 feet north and 9 feet west of the southeast corner.  
Ground elevation: 1,405.0 ft. (t). (Denton 7.5 min. quadrangle)  
Depth to water: 69.7 ft. (7-23-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Silt, moderately clayey, light gray; contains a few limy grains.....	1.0	7.5
Clay, slightly sandy, reddish gray; sand is very fine to fine.....	7.5	8.5
Till, clay, sandy to gravelly, calcareous, yellow- ish brown; pale yellow below 11 ft; contains some light yellowish brown from 45 to 50 ft.....	8.5	60.0
Till, clay, sandy to gravelly, calcareous, yellow- ish brown; in part very gravelly with some pebbles; fine-textured; contains less gravel from 106 to 115 ft.....	60.0	120.0
Silt, slightly clayey, slightly sand, slightly cal- careous, light gray; micaceous.....	120.0	130.0
Till, clay, slightly sandy to slightly gravelly, calcareous, pale olive.....	130.0	135.0
Silt, slightly clayey, slightly calcareous, gray; micaceous; slightly sandy below 140 ft; sand is very fine to fine; pale yellow from 155 to 165 ft; light gray to yellowish brown from 165 to 175 ft..	135.0	185.0
Clay, silty, slightly sandy, grayish brown; sand is very fine to fine; contains some dark gray below 195 ft.....	185.0	210.0
Sand, fine to very coarse with some fine gravel.....	210.0	215.0
Till, clay, sandy to gravelly, calcareous, medium gray with bluish tint.....	215.0	260.0

Test Hole #50-B-45  
(A8-6-26ad)  
Lancaster County

Location: SE corner NE sec. 26, T. 8 N., R. 6 E., approximately  
2,528 feet south and 62 feet west of the northeast corner.  
Ground elevation: 1,258.0 ft. (a). (Roca 7.5 min. quadrangle)  
Depth to water: 10.2 ft. (11-21-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Silt, moderately clayey, light gray; contains a few limy nodules and sand grains.....	1.0	10.0
Silt, moderately clayey, pale brown; contains a trace of medium sand; contains some iron stain below 14 ft.....	10.0	20.0
Clay, silty, slightly calcareous, light gray; con- tains a trace of limy grains.....	20.0	30.0
Till, clay, silty, slightly sandy, fine-textured; contains a few common shale grains.....	30.0	48.0
Limy nodular zone, light gray.....	48.0	48.5
Clay, silty, very calcareous, light gray.....	48.5	50.0
Clay, silty, black; carbonaceous.....	50.0	51.0
Silt, clayey, medium gray.....	51.0	58.5
Permian System - Big Blue Series - Council Grove Group:		
Limestone, light gray; light brown below 60 ft.....	58.5	62.

Test Hole #57-A-51  
(A8-6-27cd)  
Lancaster County

Location: SE SE SW sec. 27, T. 8 N., R. 6 E., approximately 30  
feet north and 2,500 feet east of southwest corner.  
Ground elevation: 1,252.0 ft. (t). (Cortland 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brown to black.....	0.0	2.0
Silt, slightly clayey, dark brown; moderately clayey and slightly lighter color below 5 ft.....	2.0	9.5
Sand, silty; sand is very fine to medium.....	9.5	19.0
Sand, silty; sand is very fine to coarse.....	19.0	25.0
Clay, silty, light brown.....	25.0	25.5
Clay, slightly silty, light gray with bluish tint...	25.5	33.0
Sand, fine to very coarse.....	33.0	34.5
Silt, sandy, light gray with greenish tint; sand is very fine.....	34.5	35.0
Clay, silty, light gray.....	35.0	40.0

Test Hole #5-A-54  
(A8-6-34dd)  
Lancaster County

Location: NE SE SE sec. 34, T. 8 N., R. 6 E., approximately 750 feet north and 30 feet west of the southeast corner.  
Ground elevation: 1,284.0 ft. (a). (Cortland 7.5 min. quadrangle)  
Depth to water: 8.0 ft. (5-21-54).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Silt, moderately clayey, medium brownish gray; slightly sandy below 1.5 ft; sand is fine to medium.....	0.0	3.5
Silt, moderately clayey, dark brownish gray; very clayey from 5 to 6 ft; contains a few scattered sand grains from 6 to 10 ft; slightly darker color below 10 ft.....	3.5	13.0
Silt, moderately clayey, light greenish gray; very clayey below 15 ft; contains a yellowish tint at 18 ft.....	13.0	19.5
Silt, moderately clayey, gray; dark gray below 25 ft.....	19.5	34.3
Clay, silty, light olive gray; contains some mottled yellowish brown from 36 to 40 ft; contains a silt layer below 41 ft.....	34.3	42.3
Sand, gravelly; fine sand to fine gravel; contains some reworked sandstone fragments.....	42.3	45.0
Sand and gravel, fine sand to fine gravel; principally reworked shale and clay grains.....	45.0	50.0
Sand, very fine to fine with some medium.....	50.0	60.0



Test Hole #12-B-49  
(A8-7-16bb)  
Lancaster County

Location: NW NW NW sec. 16, T. 8 N., R. 7 E., approximately 251 feet south and 10 feet east of the northwest corner.  
Ground elevation: 1,335.0 ft. (t). (Roca 7.5 min. quadrangle)  
Depth to water: 31.6 ft. (7-9-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	1.0
Soil, silt, clayey; slightly granular texture, medium to dark brown.....	1.0	3.5
Silt, slightly clayey, medium buff brown.....	3.5	14.5
Silt, slightly clayey, medium brown; granular texture below 15 ft.....	14.5	17.0
Till, clay; sandy to pebbly, yellowish gray.....	17.0	20.0
Till, clay, moderately calcareous; sandy to pebbly, yellowish brown; contains much limonitic stain; contains some light gray below 36 ft.....	20.0	37.0
Sand and gravel, coarse sand to medium gravel; contains some pebbles.....	37.0	41.5
Till, silt, clayey, sandy, moderately calcareous, yellowish brown and gray; sand is very fine; contains a few limy pebbles and ironstone fragments..	41.5	43.5
Clay, silty, moderately calcareous, pinkish gray; contains some limy areas and limy grains.....	43.5	65.0
Silt, clayey, moderately calcareous, buff gray; contains some pebbles; contains some iron stain, sandy; sand is very fine below 70 ft.....	65.0	80.0
Silt, clayey, moderately calcareous, brownish-gray; contains some pebbles; contains some limestone fragments below 85 ft.....	80.0	85.6
Permian System - Big Blue Series - Council Grove Group:		
Grenola Formation:		
Burr Member:		
Limestone, buff gray; light gray, shaly below 86 ft.....	85.6	90.8
Shale, dark gray, limy.....	90.8	91.0
Limestone, light gray, shaly.....	91.0	93.0
Legion Member:		
Shale, buff to yellowish gray, silty, clayey; dark gray to black from 94 to 94.6 ft; limy shale from 94.6 to 94.9 ft; medium dark gray below 94.9 ft...	93.0	98.0
Sallyards Member:		
Limestone, light gray to medium gray; contains some shale below 98.5 ft.....	98.0	100.0

Roca Formation:

Shale, medium gray, limy, medium dark gray from 101.5 to 104 ft; contains a slightly bluish tint below 104 ft.....	100.0	110.0
Shale, light gray, clayey, moderately calcareous, very calcareous from 111 to 111.8 ft; greenish gray below 111.8 ft.....	110.0	112.8
Limestone, light gray, shaly.....	112.8	113.2
Shale, greenish gray, silty, clayey, moderately calcareous; medium tannish brown, in part reddish brown from 114 to 115 ft.....	113.2	118.0

Red Eagle Formation:

Howe Member:

Limestone, light gray; medium dark gray and shaly from 118.6 to 120.9 ft.....	118.0	121.8
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Bennett Member:

Shale, dark gray to black, silty, clayey, very calcareous, moderately calcareous from 126.8 to 127 ft; slightly calcareous below 127 ft.....	121.8	130.0
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Glenrock Member:

Limestone, medium dark gray, in part shaly.....	130.0	131.5
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Johnson Formation:

Shale, medium gray, silty, clayey, moderately calcareous.....	131.5	133.0
Shale, greenish gray to bluish gray, clayey, slightly calcareous; contains some light gray shale from 137.2 to 138 ft.....	133.0	139.9
Limestone, light gray, shaly.....	139.9	140.1
Shale, light gray, clayey, moderately calcareous, reddish brown from 141.5 to 143 ft.....	140.1	145.5
Shale, light gray, limy.....	145.5	147.5

Foraker Formation:

Long Creek Member:

Limestone, light gray, shaly.....	147.5	148.0
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Hughes Creek Member:

Shale, light gray, silty, clayey, very calcareous...	148.0	149.6
Shale, dark gray to black, clayey, very calcareous..	149.6	155.0
Shale, dark gray, silty, clayey, moderately calcareous.....	155.0	163.0
Limestone, medium dark gray, shaly.....	163.0	165.0
Shale, dark gray to medium gray, silty, clayey, moderately calcareous.....	165.0	171.0
Limestone, medium gray, shaly.....	171.0	172.0
Shale, black, clayey, very calcareous.....	172.0	173.0
Limestone, light gray.....	173.0	174.9
Shale, dark gray, clayey, moderately calcareous.....	174.9	178.0
Shale, medium gray, limy, to limestone.....	178.0	180.0
Shale, clayey, very calcareous; contains limestone lenses.....	180.0	183.5
Limestone, light gray.....	183.5	184.8
Shale, dark gray, silty, clayey, moderately calcareous.....	184.8	185.5
Limestone, medium gray, shaly.....	185.5	187.0

Shale, light to dark gray, silty, clayey, very calcareous.....	187.0	191.3
Americus Member:		
Limestone, light gray, fossiliferous.....	191.3	192.3
Shale, dark gray to black, silty, clayey, very calcareous.....	192.3	193.3
Limestone, medium to dark gray, fossiliferous.....	193.3	195.1
Admire Group:		
Hamlin Formation:		
Shale, medium dark gray, clayey, moderately calcareous.....	195.1	198.8
Shale, light gray, limy; contains a limestone layer from 200 to 200.1 ft.....	198.8	201.3
Shale, light gray to green, silty, clayey, very calcareous.....	201.3	205.3
Shale, pinkish brown, silty, clayey, very calcareous; contains some limy areas below 207.5 ft.....	205.3	210.2
Shale, light greenish gray, silty, clayey, slightly calcareous; contains thin interbedded limy layers, medium gray below 213.2 ft.....	210.2	214.0
Shale, reddish brown, silty, clayey, very calcareous, medium dark gray below 218 ft.....	214.0	219.5
Five Point Formation:		
Limestone, light greenish gray, shaly.....	219.5	222.8
West Branch Formation:		
Shale, red and light gray, silty, clayey, very calcareous, slightly calcareous below 225 ft.....	222.8	230.0
Limestone, light gray.....	230.0	230.6
Shale, medium dark gray, limy, sandy, micaceous; sand is very fine.....	230.6	231.2
Limestone, light gray.....	231.2	231.5
Shale, dark gray, silty, clayey, very calcareous, in part micaceous.....	231.5	233.0
Shale, light green to grayish green, silty, clayey, very calcareous, medium gray to red below 236.5 ft.....	233.0	238.5
Shale, light gray with greenish tint, limy.....	238.5	241.0
Falls City Formation:		
Limestone, light gray.....	241.0	244.0
Shale, light greenish gray, silty, very calcareous..	244.0	244.5
Limestone, light buff gray.....	244.5	245.0
Onaga Formation:		
Shale, light gray with slight green tint, limy to limestone.....	245.0	247.2
Shale, medium dark gray, clayey, moderately calcareous; contains some greenish gray below 250 ft....	247.2	252.0
Shale, red, silty, clayey, slightly calcareous; contains some interbedded brownish red limy layers below 257.5 ft.....	252.0	263.5
Shale, mottled buff, dark gray and red, silty, clayey, very calcareous.....	263.5	267.5
Shale, dark gray to black, clayey, very calcareous..	267.5	270.0
Shale, dark gray, clayey, very calcareous.....	270.0	274.6
Shale, light gray, clayey, very calcareous.....	274.6	276.7

Pennsylvanian System - Virgil Series - Wabaunsee Group:

Wood Siding Formation:

Brownville Member:

Limestone, light gray.....	276.7	278.1
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Pony Creek - Plumb Members:

Shale, medium gray, clayey, very calcareous.....	278.1	280.4
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Shale, red to brownish red, silty, clayey, slightly calcareous.....	280.4	289.8
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Shale, medium dark gray, silty, clayey.....	289.8	292.2
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Nebraska City Member:

Shale, light gray, limy to limestone.....	292.2	292.5
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Root Formation:

French Creek - Friedrich Members:

Shale, dark medium gray, silty, clayey, very calcareous; contains some coal below 293.2 ft.....	292.5	293.5
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Shale, light gray, silty, clayey, sandy, very calcareous; sand is very fine.....	293.5	300.0
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Shale, medium dark gray, clayey, very calcareous....	300.0	300.8
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Shale, light gray with greenish tint, silty, clayey, very calcareous.....	300.8	304.0
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Shale, red, silty, clayey, moderately calcareous, brownish red below 305 ft.....	304.0	307.6
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Stotler Formation:

Grandhaven Member:

Limestone, yellowish tan.....	307.6	310.0
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Test Hole #4-A-54  
(A8-7-18da)  
Lancaster County

Location: SE NE SE sec. 18, T. 8 N., R. 7 E., approximately 1,600 feet north and 500 feet west of the southeast corner.  
Ground elevation: 1,213.0 ft. (a). (Roca 7.5 min. quadrangle)  
Depth to water: 10.0 ft. (5-21-54).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, moderately clayey, dark brownish gray; moderately clayey below 4.5 ft.....	0.0	5.5
Clay, silty, medium brownish gray; dark brownish gray from 6.5 to 9 ft; light brownish gray from 9 to 16.3 ft.....	5.5	17.5
Silt, moderately clayey, brown to gray; medium dark brownish gray below 21 ft.....	17.5	23.0
Silt, moderately clayey, slightly sandy, medium brownish gray; sand is very fine to fine.....	23.0	25.0
Silt, very clayey, light brownish gray.....	25.0	27.5
Silt, moderately clayey, light gray with olive tint; light olive gray below 30 ft.....	27.5	33.5
Sand and gravel, fine sand to fine gravel (50 percent gravel); contains some medium gravel below 35 ft.....	33.5	40.0
Gravel, fine to medium with some fine to coarse sand.....	40.0	42.4
Permian System - Big Blue Series - Council Grove Group:		
Shale, pale olive, calcareous.....	42.4	43.8
Shale, medium gray, calcareous; contains some thin limestone layers.....	43.8	45.0

Test Hole #3-A-54  
(A8-7-20dd)  
Lancaster County

Location: NE SE SE sec. 20, T. 8 N., R. 7 E., approximately 1,100 feet north and 39 feet west of the southeast corner.  
Ground elevation: 1,250.0 ft. (t). (Roca 7.5 min. quadrangle)  
Depth to water: 9.3 ft. (5-20-54).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, moderately clayey, dark brownish gray.....	0.0	3.5
Soil, silt, black.....	3.5	5.5
Silt, slightly clayey, darkish gray.....	5.5	8.0
Silt, moderately clayey, moderately sandy, dark gray; sand is very fine to fine; slightly sandy below 11 ft.....	8.0	17.0
Silt, very clayey, medium gray; dark gray below 20 ft.....	17.0	24.5
Silt, very clayey, slightly sandy, light olive gray; sand is very fine.....	24.5	28.0
Sand, fine to very coarse with some fine gravel; principally shale and limy fragments.....	28.0	30.2
Permian System - Big Blue Series - Council Grove Group:		
Limestone, light gray.....	30.2	31.3

Test Hole #2-A-54  
(A8-7-21bb)  
Lancaster County

Location: NW NW NW sec. 21, T. 8 N., R. 7 E., approximately 28  
feet south and 352 feet east of the northwest corner.  
Ground elevation: 1,266.0 ft. (a). (Roca 7.5 min. quadrangle)  
Depth to water: 9.5 ft. (5-20-54).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, black.....	0.0	3.0
Clay, slightly silty, grayish brown; light grayish brown below 4 ft.....	3.0	5.5
Silt, moderately clayey, grayish brown; slightly sandy, dark grayish brown; sand is very fine below 10 ft.....	5.5	13.8
Clay, silty, sandy, dark gray; sand is very fine to very coarse with some fine gravel; principally shale and limy fragments.....	13.8	15.0
Sand, silty; sand is very fine to very coarse with some fine gravel, principally shale, limy fragments, and sandstone.....	15.0	16.1
Permian System - Big Blue Series - Council Grove Group:		
Shale, pale yellow, clayey, calcareous.....	16.1	18.0
Shale, light gray, clayey, calcareous; contains some interbedded limestone layers.....	18.0	20.3

Test Hole #10-B-49  
(A8-7-25dd)  
Lancaster County

Location: SE SE SE sec. 25, T. 8 N., R. 7 E., approximately 458 feet north and 9 feet west of the southeast corner.  
Ground elevation: 1,348.0 ft. (a). (Bennett 7.5 min. quadrangle)  
Depth to water: unknown; test hole caved at 22.0 ft. (7-2-49).

Depth, in feet  
From To

Quaternary System, undifferentiated:

Soil, clayey, silty, slightly calcareous, dark brown to black.....	0.0	1.0
Silt, clayey, dark brown; medium brown from 1.5 to 2.5 ft.....	1.0	3.5
Clay, silty, medium dark brown; contains some sand; sand is very fine from 7 to 10 ft.....	3.5	12.5
Silt, clayey, dark brown; granular texture.....	12.5	15.0
Silt, clayey, medium brown.....	15.0	16.5
Till, clayey, silty, moderately calcareous, sandy to pebbly, light brown with some yellowish brown, contains some limy nodules.....	16.5	50.0



Test Hole #1-A-54  
(A8-7-30cd)  
Lancaster County

Location: SW SE SW sec. 30, T. 8 N., R. 7 E., approximately 100 feet north and 2,000 feet east of the southwest corner.  
Ground elevation: 1,265.0 ft. (a). (Cortland 7.5 min. quadrangle)  
Depth to water: 13.8 ft. (5-21-54).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, brown with some dark brown.....	0.0	0.5
Clay, slightly silty, moderately sandy, reddish brown; sand is very fine to fine with some medium.	0.5	3.5
Silt, slightly clayey, moderately sandy, dark reddish brown; sand is very fine to fine with some medium; very sandy; sand is very fine to medium below 5 ft.....	3.5	6.0
Sand, slightly silty; sand is very fine to medium with some coarse; sand is very fine to coarse below 10 ft.....	6.0	12.5
Silt, slightly clayey, very sandy, slightly calcareous, light brownish gray; sand is very fine to fine.....	12.5	14.0
Sand, clayey, silty; sand is fine to very coarse with some fine gravel and a trace of medium gravel.....	14.0	18.0
Clay, slightly sandy, reddish brown; sand is very fine to fine.....	18.0	20.6
Silt, slightly clayey, moderately sandy, moderately calcareous, light brownish gray to pinkish gray; sand is very fine to fine.....	20.6	25.0
Clay, slightly silty, moderately calcareous, grayish brown.....	25.0	35.0
Clay, slightly silty, moderately calcareous, light gray; contains a trace of very fine sand below 40 ft; contains some limy grains below 45 ft.....	35.0	50.0

Test Hole #56-A-51  
(A8-7-33ab)  
Lancaster County

Location: NW NW NE sec. 33, T. 8 N., R. 7 E., approximately 30  
feet south and 2,600 feet west of the northeast corner.  
Ground elevation: 1,240.0 ft. (t). (Cortland 7.5 min. quadrangle)  
Depth to water: 4.0 ft. (11-28-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	4.0
Silt, slightly clayey, medium brown; slightly more clayey, slightly lighter color below 5 ft.....	4.0	9.0
Silt, moderately clayey, medium yellowish brown; slightly darker color below 12.5 ft.....	9.0	16.0
Silt, moderately clayey, medium brown; yellowish brown below 19.5 ft.....	16.0	28.5
Silt, slightly clayey, light brown.....	28.5	29.5
Sand, fine to very coarse.....	29.5	31.0

Test Hole #2-B-49  
(A8-8-7cc)  
Lancaster County

Location: SW SW SW sec. 7, T. 8 N., R. 8 E., approximately 9 feet north and 292 feet east of the southwest corner.  
Ground elevation: 1,401.0 ft. (a). (Bennett 7.5 min. quadrangle)  
Depth to water: 16.8 ft. (6-25-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	2.5
Clay, silty, very pale brown.....	2.5	3.5
Silt, moderately clayey, very pale brown; contains a few limy nodules; contains iron stain and some dark carbonaceous flecks below 10 ft.....	3.5	11.0
Clay, silty, sandy, reddish brown; sand is very fine to fine; contains a few ironstone grains.....	11.0	16.5
Till, clay, silty, sandy to gravelly, light gray with some pale brown; slightly less gravelly and contains iron stain below 18 ft; mostly light yellowish brown below 58.5 ft.....	16.5	60.0
Till, silty, clayey, sandy, moderately calcareous, yellowish brown with some light gray; slightly gravelly below 65 ft.....	60.0	70.0
Till, silty, clayey, sandy to gravelly, very calcareous, yellowish brown.....	70.0	74.0
Sand, silty; sand is fine to medium with some coarse; contains many dark silicates and some calcareous grains; contains coarse sand below 85 ft; contains some thin dark gray silty clay layers, sand; sand is very fine below 89 ft.....	74.0	101.5
Sand, gravelly, silty; coarse sand to fine gravel, mostly dark silicates and limestone fragments (30 percent gravel); contains 60 percent gravel below 105 ft.....	101.5	111.5
Till, clay, silty, sandy to slightly gravelly, moderately calcareous, darkish gray; in part very silty, pale brown below 147 ft.....	111.5	159.0
Silt, moderately clayey, moderately calcareous, pale brown; contains some limy grains, in part light gray, slightly sandy; sand is very fine below 168.5 ft.....	159.0	170.0
Silt, moderately clayey, in part sandy, moderately calcareous, light gray with olive tint; sand is very fine; contains some limy nodules.....	170.0	175.0
Silt, moderately clayey, moderately calcareous, pale brown with some light gray; contains iron stain, some limestone fragments, and limy grains..	175.0	180.0
Silt, moderately clayey, slightly sandy, moderately calcareous, light gray, sand is very fine; contains iron stain and a few dark silicates.....	180.0	208.0

Permian System - Big Blue Series - Council Grove Group:

Limestone, light gray.....	208.0	216.0
Shale, gray, clayey.....	216.0	229.0
Limestone, light gray.....	229.0	230.0

Test Hole #8GT-80  
Lancaster County

Location: SE corner SW SE SW sec. 22, T. 8N., R. 8E., approximately  
135 feet north of the south section line and 725 feet  
west of the half section line.

Ground elevation: 1,342.0 ft. (hl). (Bennett 7.5 min. quadrangle)

Depth to water: unknown.

Depth, in feet  
From To

Quaternary System, undifferentiated:

Topsoil, very dark brown, very silty, moderately clayey; contains organic material.....	0.0	3.0
Silt, light brownish gray, moderately clayey.....	3.0	7.0
Silt, dark reddish gray, moderately clayey.....	7.0	12.0
Silt, light yellowish brown, moderately clayey, very slightly to slightly sandy; contains yellow iron staining upper 3.0 ft.....	12.0	28.0
Silt, light olive brown; contains silt, dark gray, clayey; slightly sandy lower 5.0 ft.....	28.0	40.0
Silt, dark gray, clayey, slightly sandy.....	40.0	50.0
Silt, dark gray, clayey; contains traces of medium to coarse sand and fine gravel, coarser grained lower 19.0 ft.....	50.0	79.0
Sand and gravel, darkish gray; sand is fine to very coarse grained, gravel is fine; contains reworked shale, and limestone fragments.....	79.0	130.5

Permian System - Big Blue Series - Council Grove Group:

Limestone, grayish brown with olive tint, very finely crystalline; contains pyrite.....	130.5	132.5
Limestone, pale yellow, very finely crystalline; interbedded with shale, pale olive.....	132.5	137.0
Limestone, pale olive, finely crystalline, silty....	137.0	139.5
Shale, dark gray, limy.....	139.5	140.0
Shale, black, fissile.....	140.0	142.5
Limestone, dark gray, very finely crystalline; contains pelecypods and fusulinids.....	142.5	144.0
Shale, gray to greenish gray, moderately to very limy.....	144.0	154.0
Shale, gray to greenish gray with traces of reddish brown; interbedded with limestone, very light olive brown, finely crystalline, shaly.....	154.0	160.0
Limestone, light greenish gray, finely crystalline, very silty.....	160.0	162.0
Shale, dark gray, very limy from 162.0 to 164.5 ft..	162.0	170.0
Shale, dark gray, interbedded with limestone, dark gray, finely crystalline; contains crinoids, brachiopods, at 177.6 to 178.0 ft.....	170.0	180.0
Shale, gray, contains brachiopod spines.....	180.0	185.0
Shale, black, fissile.....	185.0	186.5

Limestone, gray, finely crystalline; contains brachiopods, pyrite, glauconite, interbedded with shale, gray.....	186.5	190.0
Shale, gray, limy.....	190.0	198.5
Shale, darkish gray, interbedded with limestone at 198.5 to 199.5 ft. and 201.0 to 202.3 ft. (taken from E-log).....	198.5	202.3
Admire Group:		
Shale, dark gray, intermittantly limy.....	202.3	209.5
Shale, very dark gray; contains brachiopods.....	209.5	214.5
Limestone, light to medium gray, very finely crystalline; contains crinoids, algal material, shaly.....	214.5	216.0
Shale, greenish gray; interbedded with limestone, light greenish gray, finely crystalline; contains brachiopods, pyrite.....	216.0	218.0
Shale, pale red mottled with greenish gray.....	218.0	220.0
Shale, greenish gray.....	220.0	226.0
Shale, reddish brown.....	226.0	228.0
Shale, gray with greenish tint; interbedded with thin limestones, light tannish gray, very finely crystalline.....	228.0	235.0
Shale, gray, slightly to moderately limy.....	235.0	240.0
Shale, dark gray, slightly to moderately limy.....	240.0	249.0
Shale, light gray with greenish tint.....	249.0	254.0
Shale, dark gray with reddish tint.....	254.0	255.0
Shale, very light gray, limy.....	255.0	257.0
Shale, gray to dark gray.....	257.0	260.0
Shale, gray to dark gray, limy.....	260.0	266.0
Shale, reddish brown, very limy 271.0 to 276.0 ft...	266.0	276.0
Shale, reddish brown.....	276.0	280.0
Shale, dark gray.....	280.0	285.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, dark gray; interbedded with limestone, dark gray, finely crystalline.....	285.0	291.0
Shale, reddish brown.....	291.0	293.0
Shale, light gray with greenish tint, limy.....	293.0	300.0
Shale, dark gray mottled with yellowish brown; interbedded with limestones, dark gray, finely crystalline, shaly lower 6.0 ft.....	300.0	310.0
Shale, dark gray.....	310.0	315.0
Shale, dark gray with reddish mottling.....	315.0	319.0
Shale, reddish brown.....	319.0	325.0
Shale, olive; contains coal, 325.0 to 325.5 ft.....	325.0	330.0
Shale, dark gray.....	330.0	350.0
Shale, dark gray; contains sandstone, medium gray, very fine grained.....	350.0	355.0
Shale, dark gray; contains shale, black, lower 1.0 ft.....	355.0	362.0
Shale, medium to dark gray, moderately limy at 385.5 to 387.0 ft.....	362.0	390.5
Shale, dark grayish brown with olive tint, limy at 390.5 to 390.8 ft.....	390.5	393.0

Limestone, very light gray to white, finely crystalline, slightly to moderately shaly; contains algal material, glauconite.....	393.0	394.5
Shale, gray with greenish tint.....	394.5	420.0
Shale, medium to dark gray, very limy 426.0 to 431.0 ft., very hard 429.0 to 429.5 ft.....	420.0	431.0
Shale, medium to dark gray, very limy.....	431.0	436.2
Limestone, very light tannish gray, finely crystalline; contains brachiopods.....	436.2	438.5
Shale, medium to dark gray.....	438.5	440.0
Limestone, very light tannish gray, very finely crystalline, slightly shaly; contains brachiopods, gastropods, crinoids.....	440.0	443.0
Limestone, grayish brown, very finely crystalline, slightly shaly in part; contains brachiopods, glauconite.....	443.0	448.5
Shale, reddish brown, mottled with olive, hard at 451.0 and 453.5 to 454.2; more olive at base.....	448.5	454.2
Shale, dark gray.....	454.2	467.0
Shale, dark gray; contains thin limy interbeds.....	467.0	476.0
Limestone, gray, finely crystalline; contains brachiopods; slightly shaly at 478.2 to 478.8 ft..	476.0	479.4
Shale, medium to dark gray.....	479.4	490.2
Limestone, light gray, very finely to finely crystalline; contains pyrite; interbedded with shale, 493.0 to 494.2 ft.....	490.2	495.5
Shale, gray.....	495.5	497.0
Shale, dark gray.....	497.0	502.6
Shale, black, fissile.....	502.6	503.0

Test Hole #25-B-44  
(A8-8-26aa)  
Lancaster County

Location: NE NE NE sec. 26, T. 8 N., R. 8 E., approximately 112 feet west and 5 feet south of the northeast corner.  
Ground elevation: 1,393.0 ft. (a). (Bennett 7.5 min. quadrangle)  
Depth to water: 9.0 ft. (8-21-44).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, black.....	0.0	1.0
Silt, moderately clayey, slightly calcareous, light gray.....	1.0	5.0
Clay, silty, reddish brown; contains a slight trace of sand.....	5.0	10.5
Till, clayey, sandy, very calcareous, gray with some pale yellow; iron stained; gravelly below 15 ft.....	10.5	30.0
Till, clayey, sandy to gravelly, very calcareous, gray, some pale yellow, and light brown; contains olive tint below 50 ft.....	30.0	55.0
Till, clayey, sandy to gravelly, very calcareous, pale yellow.....	55.0	61.5
Sand, clayey, silty; sand is fine to very coarse with some fine gravel.....	61.5	68.0
Till, clayey, silty; sand is fine to very coarse with some fine gravel.....	68.0	85.0
Sand, very silty; sand is fine to very coarse with some fine gravel.....	85.0	90.0
Till, clayey, sandy to gravelly, very calcareous, dark gray.....	90.0	106.5
Silt, slightly clayey, slightly sandy, pale yellow; sand is very fine with a few coarser grains.....	106.5	110.0
Sand and gravel, fine sand to medium gravel, principally limestone, shale, and dark silicates; silty and clayey, slightly finer grained below 115 ft.....	110.0	125.0
Sand and gravel, fine sand to fine gravel, principally limestone, shale fragments, and dark silicates; contains some pyrite grains.....	125.0	135.5
Permian System - Big Blue Series - Council Grove Group:		
Shale, gray, clayey, silty, calcareous.....	135.5	140.0
Shale, light greenish gray, clayey, calcareous.....	140.0	153.0
Limestone, pink to light gray.....	153.0	155.0



Test Hole #11-B-49  
(A8-8-31bb)  
Lancaster County

Location: SW NW NW sec. 31, T. 8 N., R. 8 E., approximately 1,091 feet south and 8 feet east of the northwest corner.  
Ground elevation: 1,322.0 ft. (a). (Firth 7.5 min. quadrangle)  
Depth to water: 33.1 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Soil, silty, clayey, slightly calcareous, granular texture, dark brown to black.....	1.0	7.0
Silt, clayey, granular texture, dark grayish brown; slightly lighter color; contains some limestone grains below 10 ft.....	7.0	12.0
Silt, moderately clayey, light grayish brown.....	12.0	16.0
Silt, moderately clayey, light brownish gray; contains some iron stain; medium gray below 17.5 ft.....	16.0	20.0
Silt, moderately clayey, pale brown; contains iron stain and rootlets.....	20.0	25.0
Silt, very clayey, slightly sandy, pale brown; contains some iron stain; sand is very fine.....	25.0	30.0
Sand, clayey to silty; sand is very fine; contains some iron stain.....	30.0	35.0
Sand and gravel, clayey, silty; very fine sand to medium gravel; contains iron stain; contains a sand lens; sand is very fine from 47 to 48 ft.....	35.0	50.0
Sand, medium to coarse with some pebbles.....	50.0	52.5
Sand and gravel, very coarse sand to fine gravel; contains some pebbles and reworked sandstone grains.....	52.5	55.0
Sand, coarse to very coarse with some pebbles.....	55.0	65.0
Sand, very coarse with some pebbles; sand is coarse from 80 to 85 ft.....	65.0	90.0
Sand, coarse to very coarse.....	90.0	113.5
Permian System - Big Blue Series - Council Grove Group:		
Limestone, green buff.....	113.5	120.0

Test Hole #3-B-48  
(A9-5-22aa)  
Lancaster County

Location: NW NE NE sec. 22, T. 9 N., R. 5 E., approximately 44 feet south and 740 feet west of the northeast corner.

Ground elevation: 1,218.0 ft. (a). (Denton 7.5 min. quadrangle)

Depth to water: 9.7 ft. (5-14-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey to sandy, dark brown to black....	0.0	2.0
Silt, sandy, medium dark brown; sand is fine.....	2.0	3.0
Sand, silty, to sandy silt, medium dark brown; sand is fine.....	3.0	4.5
Soil, silt, clayey, sandy, black; sand is fine.....	4.5	5.0
Sand, silty; sand is very fine with some coarser grains; contains pelecypods and gastropods; contains interbedded sandy silt lenses.....	5.0	9.0
Sand, fine to coarse with a little fine gravel; contains some pebbles.....	9.0	16.0
Silt, clayey, dark brownish gray.....	16.0	19.0
Clay, silty, light gray with greenish tint; brownish gray silt layer below 19.5 ft.....	19.0	22.0
Clay, silty, dark gray to black; granular texture below 25 ft.....	22.0	30.0
Silt, clayey, sandy, darkish gray to black; sand is fine; contains some wood fragments below 35 ft....	30.0	39.0
Silt, in part sandy, medium gray to greenish gray; sand is fine; contains more sand below 45 ft.....	39.0	48.0
Sand, fine to coarse with some fine to medium gravel.....	48.0	50.0
Sand and gravel, medium sand to medium gravel with some coarse gravel.....	50.0	57.0
Silt, clayey, sandy, dark brownish gray.....	57.0	58.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, red with some light gray, clayey.....	58.0	60.0
Siltstone, grayish white, clayey.....	60.0	66.0
Shale, white with some mottled red, clayey.....	66.0	78.5
Siltstone, white to gray, sandy.....	78.5	84.0
Shale, medium gray, clayey, light gray, light brown, and red below 86 ft.....	84.0	100.0

Test Hole #19-B-46  
(A9-5-34ac)  
Lancaster County

Location: NE corner NW SE sec. 34, T. 9 N., R. 5 E., approximately  
2,648 feet north and 1,350 feet west of the southeast corner.  
Ground elevation: 1,361.0 ft. (a). (Denton 7.5 min. quadrangle)  
Depth to water: Unknown; test hole caved at 46.8 ft. (6-6-46).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Till, clay, sandy to gravelly, calcareous, yellowish brown; contains some light gray below 11.5 ft.	0.0	20.0
Sand, fine to coarse with some fine gravel.....	20.0	60.0
Till, clay, sandy to gravelly, calcareous, dark gray with some yellow.....	60.0	62.5
Silt, slightly clayey, slightly calcareous, light gray with greenish tint; contains some yellowish brown below 95 ft.....	62.5	100.5
Till, silt, sandy, slightly calcareous, light brownish gray; sand is very fine to coarse with some coarser grains; contains many varicolored shale clay grains; contains a trace of shell fragments from 125 to 130 and from 160 to 170 ft; slightly less sandy below 140 ft.....	100.5	190.0
Silt, slightly clayey, light gray; contains a trace of carbonaceous material from 190 to 195 ft.....	190.0	243.0
Sand, slightly silty; sand is fine to medium.....	243.0	256.0
Sand, fine to medium with some coarse; contains some ironstone grains.....	256.0	277.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine grained.....	277.0	280.0
Sandstone, fine to coarse grained; contains some white, sandy silt lenses from 286 to 290 ft; sand is medium to coarse below 290 ft.....	290.0	300.0

Test Hole #2-43  
(A9-6-2)  
Lancaster County

Location: NE corner NW NW sec. 2, T. 9 N., R. 6 E., approximately  
100 feet west and 25 feet south of the center of the section.  
Ground elevation: 1,159.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 18.4 ft. (4-29-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, black.....	0.0	2.0
Clay, silty, dark gray.....	2.0	22.0
Sand, gravelly; fine sand to fine gravel with some medium gravel; contains more gravel below 26 ft...	22.0	33.0
Sand, fine to very coarse with some fine gravel.....	33.0	36.0
Gravel; fine to medium; contains some coarse to very coarse sand.....	36.0	38.0
Clay, bluish gray; contains a trace of coal.....	38.0	48.0
Sand, fine to very coarse with some fine gravel.....	48.0	55.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, fine to medium with some coarse.....	55.0	59.0
Sample missing.....	59.0	60.0
Sand, fine to medium.....	60.0	65.0
Permian System - Big Blue Series - Admire Group:		
Shale, black, clayey, carbonaceous; contains brown specks.....	65.0	71.0
Shale, light gray, silty, slightly calcareous.....	71.0	72.0
Limestone, light gray.....	72.0	74.0

Test Hole #3-43  
(A9-6-2dc1)  
Lancaster County

Location: SE SW SE sec. 2, T. 9 N., R. 6 E., approximately 1,820 feet west and 30 feet north of the southeast corner.  
Ground elevation: 1,159.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 19.6 ft. (4-29-43).

Depth, in feet  
From To

Quaternary System, undifferentiated:

Silt, clayey, micaceous, pale brown; contains a trace of very fine sand.....	0.0	10.0
Sand, very fine to medium with some coarse.....	10.0	16.0
Sand, fine to very coarse with some fine to medium gravel.....	16.0	32.0
Gravel, fine to medium with some coarse; contains some medium to coarse sand.....	32.0	39.0
Sample missing.....	39.0	41.0
Clay, silty, dark bluish gray to black.....	41.0	53.0
Sand, gravelly; contains fine sand to fine gravel...	53.0	58.0
Sand and gravel, fine sand to fine gravel.....	58.0	61.0
Permian System - Big Blue Series - Admire Group:		
Shale, black, clayey; carbonaceous.....	61.0	65.0
Shale, light bluish gray, clayey, moderately calcareous; contains a crinoid joint.....	65.0	66.0

Test Hole #5-43  
(A9-6-2dc2)  
Lancaster County

Location: SE SW SE sec. 2, T. 9 N., R. 6 E., approximately 1,570 feet west and 1,240 feet north of the southeast corner.  
Ground elevation: 1,172.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 36.8 ft. (5-6-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, black.....	0.0	2.0
Clay, silty, pale.....	2.0	9.0
Clay, silty, slightly sandy, light brownish gray; sand is very fine to fine.....	9.0	19.0
Clay, silty, sandy, light brownish gray; contains some fine sand to fine gravel.....	19.0	33.0
Sand, fine to very coarse.....	33.0	36.0
Sand, gravelly; contains fine sand to fine gravel...	36.0	44.0
Sand and gravel; fine sand to fine gravel.....	44.0	57.0
Sand, fine to very coarse.....	57.0	59.0
Sand and gravel, very coarse sand to fine gravel....	59.0	69.0
Gravel, fine to medium; contains some coarse to very coarse sand.....	69.0	74.0
Sand and gravel, medium sand to fine gravel.....	74.0	84.0
Gravel, fine to medium.....	84.0	86.0

Test Hole #6-43  
(A9-6-2da)  
Lancaster County

Location: SE NE SE sec. 2, T. 9 N., R. 6 E., approximately 1,650 feet north and 740 feet west of the southeast corner.  
Ground elevation: 1,180.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 35.0 ft. (5-4-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, black.....	0.0	4.0
Clay, silty, pale brown.....	4.0	13.0
Clay, silty, sandy, pale brown; sand is very fine to medium.....	13.0	42.0
Sand, fine to very coarse with some fine gravel.....	42.0	54.0
Gravel, medium to coarse with some coarse to very coarse sand.....	54.0	55.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is medium to coarse with some coarser grains.....	55.0	59.0
Shale, reddish brown, clayey, silty, sandy; sand is very fine to medium.....	59.0	79.0
Sandstone, sand is medium to very coarse with some coarser grains.....	79.0	95.0

Test Hole #7-43  
(A9-6-2dd)  
Lancaster County

Location: SW SE SE sec. 2, T. 9 N., R. 6 E., approximately 750 feet west and 330 feet north of the southeast corner.  
Ground elevation: 1,171.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 34.2 ft. (5-6-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark gray.....	0.0	5.0
Silt, moderately clayey, light gray.....	5.0	24.0
Clay, silty, sandy, grayish brown and yellow; sand is fine to coarse.....	24.0	29.0
Clay, silty, sandy, medium dark brownish gray; sand is fine to coarse.....	29.0	39.0
Sand, gravelly; contains fine sand to fine gravel; contains much gravel below 45 ft.....	39.0	55.0
Silt, clayey, light gray; contains some fine to coarse sand.....	55.0	62.0
Silt, clayey, sandy, light gray with olive tint; sand is very fine to fine with a few coarser grains.....	62.0	79.0
Sand, fine to coarse with some fine gravel.....	79.0	83.0



Test Hole #1-L-39  
(A9-6-4cb)  
Lancaster County

Location: NW SW sec. 4, T. 9 N., R. 6 E., approximately 660 feet north and 650 feet east of the southwest corner.  
Drilled in floor of Yankee Hill Brick Pit.  
Ground elevation: 1,157.0 ft. (a). (Emerald 7.5 min. quadrangle)  
Depth to water: Artesian flow (June 1949).

	<u>Depth, in feet</u>	
	From	To
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, bluish gray, clayey to silty, micaceous; slightly more silty to sandy below 5 ft.....	0.0	10.0
Shale, light gray to brown, clayey, silty, micaceous, sandy; sand is fine grained; contains some yellowish brown sandy shale and sandstone with a trace of coal below 15 ft.....	10.0	20.0
Shale, brown, silty to sandy; contains some interbedded clayey sandstone, sand is fine to medium...	20.0	25.0
Sand, medium; contains some ironstone and sandstone with a trace of pinkish gray silty shale; contains some siderite; contains less shale from 31 to 35 ft; contains some bluish gray sandy shale below 35 ft.....	25.0	40.0
Sand, medium; contains a trace of ironstone and sandy shale; sand is medium to coarse; contains some ironstone and sandstone grains below 45 ft...	40.0	50.0
Sand, medium to coarse; contains a little ironstone and sandy shale; contains some fine sand from 55 to 60 ft; contains more coarse sand and contains interbedded bluish gray to brown sandy shale below 60 ft.....	50.0	65.0
Sand, fine to medium, micaceous; contains more medium sand from 70 to 75 ft; contains some reddish brown sandy shale below 75 ft.....	65.0	80.0
Sand, medium; contains some interbedded red clay; sand is medium to coarse below 90 ft.....	80.0	95.0
Sand, fine to coarse; contains some interbedded reddish brown clay; sand is medium to coarse and contains some interbedded reddish yellow clay below 99 ft.....	95.0	110.0
Sand, medium to coarse; sand is mostly medium grained from 120 to 125 ft.....	110.0	130.0
Sand, medium to coarse; contains some interbedded varicolored clay below 136 ft.....	130.0	146.0
Permian System - Big Blue Series - Admire Group:		
Shale, black, carbonaceous, slightly clayey.....	146.0	151.0

Test Hole #58-A-51  
(A9-6-5dd)  
Lancaster County

Location: SE SE sec. 5, T. 9 N., R. 6 E., approximately 750 feet  
north and 1,000 feet west of the southeast corner.  
Ground elevation: 1,170.0 ft. (t). (Emerald 7.5 min. quadrangle)  
Depth to water: 6.7 ft. (11-28-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Silt, slightly clayey, medium brown to black.....	2.0	5.5
Sand, silty; sand is very fine to medium.....	5.5	8.0
Silt, moderately clayey, dark brown to black.....	8.0	8.5
Sand, silty; sand is very fine to medium; slightly less silty; coarser grained below 12.5 ft.....	8.5	14.5
Sand, fine to coarse.....	14.5	25.0
Sand and gravel, fine sand to medium gravel; con- tains some sandstone fragments.....	25.0	30.0

Test Hole #1-U-42  
(A9-6-6db)  
Lancaster County

Location: NW SE SE sec. 6, T. 9 N., R. 6 E., approximately 990 feet west and 990 feet north of the southeast corner.  
Ground elevation: 1,205.0 ft. (t). (Emerald 7.5 min. quadrangle)  
Depth to water: Unknown; test hole caved at 34.6 ft.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Clay, silty, light gray.....	2.0	12.0
Silt, slightly clayey, slightly sandy, dark brown; sand is very fine.....	12.0	16.0
Silt, slightly clayey, sandy, dark brown to reddish brown; sand is very fine to coarse.....	16.0	17.5
Till, silty, clayey, sandy to gravelly, light gray with some reddish brown.....	17.5	19.0
Silt, slightly clayey, slightly sandy, light gray; sand is very fine; contains a trace of gravel grains.....	19.0	34.0
Gravel, silty; gravel is fine to medium.....	34.0	38.0
Silt, slightly clayey, sandy, light gray; sand is fine.....	38.0	42.0
Sand and gravel, fine sand to fine gravel (40 percent gravel).....	42.0	47.0
Silt, slightly clayey, slightly sandy, light gray; sand is very fine.....	47.0	49.5
Sand, silty; sand is coarse to very coarse with some fine gravel.....	49.5	54.0
Silt, slightly clayey, light gray with some dark stains; slightly micaceous.....	54.0	60.0
Clay, very silty, slightly sandy, dark gray; sand is very fine; slightly micaceous; contains some ironstone grains.....	60.0	83.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, red with mottled light gray and yellow; clayey, slightly sandy; sand is very fine; contains some mottled light gray, dark gray and brown below 87 ft.....	83.0	98.0
No sample.....	98.0	100.0
Shale, red with mottled light gray, clayey, very sandy; sand is very fine with a few coarser grains slightly sandy below 104 ft.....	100.0	105.0
Shale, light gray with mottled red and yellow, clayey, silty, in part slightly sandy; sand is very fine.....	105.0	107.0
Shale, red with mottled light gray and yellow, clayey, silty.....	107.0	109.0
Shale, light gray with mottled reddish brown, clayey, very silty, slightly sandy; sand is very fine.....	109.0	110.0

Test Hole #1-43  
(A9-6-11aa2)  
Lancaster County

Location: NW corner NE NE sec. 11, T. 9 N., R. 6 E., approximately  
1,300 feet west and 25 feet south of the northeast corner.  
Ground elevation: 1,163.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 23.5 ft. (4-29-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brown.....	0.0	2.0
Silt, slightly clayey, pale brown.....	2.0	9.0
Silt, slightly clayey, slightly sandy, light gray; sand is very fine.....	9.0	25.0
Sand, fine to coarse with a little fine gravel.....	25.0	47.0
Sand, fine to medium with some coarse; contains some fine gravel below 55 ft.....	47.0	59.0
Sand and gravel, fine sand to fine gravel.....	59.0	69.0
Sand, fine to very coarse with some fine gravel; contains no gravel below 89 ft.....	69.0	92.0
Sample missing.....	92.0	94.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, reddish brown, clayey; contains some fine grained sandstone; contains a trace of coal below 105 ft.....	94.0	108.0

Test Hole #4-43  
(A9-6-11bb)  
Lancaster County

Location: NE NW NW sec. 11, T. 9 N., R. 6 E., approximately 1,000 feet east and 25 feet south of the northwest corner.  
Ground elevation: 1,158.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 17.0 ft. (11-29-43).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brown.....	0.0	2.0
Clay, silty, dark brown; carbonaceous from 2 to 9 ft.....	2.0	28.0
Sand and gravel, coarse sand to fine gravel; contains some reworked sandstone fragments.....	28.0	48.0
Clay, sandy, dark brown; sand is very fine to medium	48.0	50.0
Sand and gravel; medium sand to fine gravel.....	50.0	57.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, medium grained.....	57.0	72.0
Permian System - Big Blue Series - Admire Group:		
Shale, medium to dark gray, clayey.....	72.0	76.0
Shale, dark gray, clayey; micaceous to 81 ft. contains bryozoan fragments.....	76.0	83.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Wood Siding Formation:		
Brownville Member:		
Limestone, medium gray; contains brachiopod fragments.....	83.0	84.0
Pony Creek - Plumb Members:		
Shale, medium gray, clayey, moderately calcareous...	84.0	86.0
Shale, light greenish gray, clayey, moderately calcareous.....	86.0	91.0
Shale, dark reddish brown to light greenish gray and black, clayey.....	91.0	99.0
Nebraska City Member:		
Limestone, light gray.....	99.0	101.0
Root Formation:		
Shale, light gray to light greenish gray, clayey, slightly sandy, slightly micaceous; contains some coal like fragments.....	101.0	112.0
Shale, dark reddish brown with some light gray, clayey.....	112.0	117.0
Stotler Formation:		
Grandhaven Member:		
Limestone, pale yellow with some red; contains some fusulinid fragments.....	117.0	120.0
Dry Member:		
Sandstone, fine grained.....	120.0	121.0
Shale, dark reddish brown to light gray, clayey, slightly sandy, micaceous.....	121.0	126.0
Sandstone, very fine grained.....	126.0	139.0

Test Hole #43-1  
(A9-6-11aa1)  
Lancaster County

Location: SW NE NE sec. 11, T. 9 N., R. 6 E., approximately 850 feet south and 900 feet west of the northeast corner.  
Ground elevation: 1,186.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: Unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, light gray, clayey, silty; in part vari-colored.....	1.0	9.0
Sandstone, sand is medium to coarse with some coarser grains; contains some iron cemented layers; contains some fine gravel and sandstone, principally ironstone below 30 ft.....	9.0	61.0
Sandstone, sand is fine to medium with some coarser grains; iron stained; contains some fine gravel grains, principally ironstone and sandstone below 55 ft.....	61.0	66.0
Shale, light greenish gray, clayey, silty.....	66.0	68.0

Test Hole #43-3  
(A9-6-11aa3)  
Lancaster County

Location: NE NE NE sec. 11, T. 9 N., R. 6 E., approximately 570 feet south and 410 feet west of the northeast corner.  
Ground elevation: 1,170.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 9.0 ft. (4-9-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Fill, principally limestone, ironstone, and glass fragments with some dark brown silty clay and soil	0.0	9.0
Clay, silty, dark brown; contains some limestone fragments.....	9.0	19.0
Clay, silty, sandy, dark gray; sand is fine to coarse.....	19.0	25.0
Sand, medium to coarse with some coarser grains; contains some fine gravel, principally ironstone grains.....	25.0	29.0
Sand, gravelly; coarse sand to fine gravel; principally limestone, ironstone, and sandstone fragments.....	29.0	39.0
Gravel, principally ironstone, sandstone, and limestone fragments.....	39.0	49.0
Sand, medium to coarse with some fine gravel; principally ironstone and clay shale fragments....	49.0	56.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, reddish yellow to yellow, clayey, silty, sandy; sand is fine to medium with some coarser grains.....	56.0	64.0
Shale, greenish gray, clayey, silty.....	64.0	65.0

Test Hole #43-4  
(A9-6-11aa4)  
Lancaster County

Location: SW NE NE sec. 11, T. 9 N., R. 6 E., approximately 740 feet south and 740 feet west of the northeast corner.  
Ground elevation: 1,171.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: Unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, clayey, sandy, dark brownish gray; sand is coarse.....	0.0	7.0
Clay, silty, sandy, medium dark brownish gray; sand is coarse.....	7.0	15.0
No sample, probably sandstone.....	15.0	18.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, brownish gray to brown, clayey, sandy; sand is medium.....	18.0	25.0
Sandstone, medium grained, iron stained.....	25.0	26.0
Shale, brown, clayey, sandy; sand is medium.....	26.0	27.0
Sandstone, fine grained, iron stained.....	27.0	37.0
Shale, brown, clayey, sandy; sand is medium.....	37.0	39.0
Sandstone to sandy shale, sand is medium.....	39.0	53.0
Shale, yellow, clayey, sandy; sand is coarse.....	53.0	54.0
Shale, greenish gray, clayey, in part sandy.....	54.0	55.0



Test Hole #43-5  
(A9-6-11aa5)  
Lancaster County

Location: SE NE NE sec. 11, T. 9 N., R. 6 E., approximately 742 feet south and 412 feet west of the northeast corner.  
Ground elevation: 1,168.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: Unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, slightly clayey, dark brown to black.....	0.0	9.0
Silt, slightly clayey, dark brownish gray.....	9.0	25.0
Sand, gravelly; sand is fine to very coarse with some fine gravel (20 percent gravel); contains some sandstone, ironstone, and limestone fragments.....	25.0	29.0
Gravel, sandy; gravel is fine to medium; sand is fine to very coarse; principally ironstone, sandstone, and limestone fragments.....	29.0	38.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone; sand is fine to medium with some coarse to very coarse; iron stained.....	38.0	44.0
Sandstone; sand is fine to coarse; iron stained.....	44.0	45.0
Shale, yellow to yellowish brown, clayey, sandy; sand is medium.....	45.0	47.0
Shale, greenish gray, clayey.....	47.0	48.0

Test Hole #1-B-49  
(A9-7-12dd)  
Lancaster County

Location: SE corner sec. 12, T. 9 N., R. 7 E., approximately 88 feet north and 29 feet west of the southeast corner.  
Ground elevation: 1,340 ft. (a). (Walton 7.5 min. quadrangle)  
Depth to water: 11.5 ft. (6-25-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, black to brown.....	0.0	1.5
Soil, clay, silty to sandy, medium brown.....	1.5	3.0
Clay, silty, slightly calcareous, dark brown.....	3.0	4.0
Till, clay, silty, slightly calcareous, light gray to yellowish brown and buff; contains a few pebbles and calcareous fragments.....	4.0	53.0
Till, clay, silty, moderately calcareous, sandy to pebbly, yellowish brown.....	53.0	55.0
Till, clay, silty, moderately calcareous, yellowish brown; contains some pebbles and calcareous fragments; contains some very coarse sand from 60 to 62 ft.....	55.0	90.0
Till, clayey, moderately calcareous, pebbly, very dark gray; contains calcareous fragments; very silty; contains many limonitic fragments below 110 ft.....	90.0	120.0
Till, clayey, silty, slightly calcareous, brown to bluish gray; contains some pebbles and calcareous fragments; brown to yellowish brown below 125 ft..	120.0	127.0
Silt, sandy, moderately calcareous, pebbly, reddish brown; sand is very fine.....	127.0	130.0
Clay, sandy to silty, slightly calcareous, dark bluish gray to yellow; sand is very coarse.....	130.0	133.0
Clay, slightly calcareous, yellowish brown to blue; contains a few pebbles; gray to brown below 136 ft.....	133.0	139.0
Permian System - Big Blue Series - Admire Group:		
Limestone, light brownish gray.....	139.0	140.6

Test Hole #13-B-49  
(A9-8-30cc)  
Lancaster County

Location: SE SW sec. 30, T. 9 N., R. 8 E., approximately 18 feet  
north and 642 feet east of the southwest corner.  
Ground elevation: 1,405.0 ft. (a). (Bennett 7.5 min. quadrangle)  
Depth to water: 11.9 ft. (7-13-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, dark brownish gray.....	0.0	1.5
Clay, silty, slightly sandy, brownish buff; sand is fine to coarse.....	1.5	2.0
Till, clayey, slightly calcareous, sandy to gravelly, yellowish brown; light gray; contains some limy grains below 5.6 ft.....	2.0	9.5
Till, clayey, moderately calcareous, sandy, light gray; contains some iron stain; gravelly from 14.5 to 15 ft; slightly gravelly below 18 ft.....	9.5	21.7
Till, clayey, moderately calcareous, sandy to gravelly, light gray; dark gray from 31.5 to 35 ft.....	21.7	40.0
Till, clayey, moderately calcareous, sandy to pebbly, yellowish brown; brownish gray below 60 ft.....	40.0	67.0
Till, clayey, silty, sandy to pebbly, moderately calcareous, medium to dark gray.....	67.0	86.0
Sand and gravel, fine sand to coarse gravel; con- tains some thin silt lenses below 95 ft.....	86.0	98.5
Till, clayey, sandy to pebbly, moderately calcareous, dark gray; contains a sand lens from 114.5 to 115 ft.....	98.5	170.0
Till, clayey, sandy, moderately calcareous, light gray with much yellowish brown stain; gravelly below 180 ft.....	170.0	185.0
Permian System - Big Blue Series - Council Grove Group:		
Foraker Formation:		
Hughes Creek Member:		
Clay, yellowish brown, silty, slightly calcareous; contains some ironstone.....	185.0	187.5
Shale, dark gray, clayey, calcareous.....	187.5	190.5
Shale, light gray, clayey, calcareous.....	190.5	191.0
Americus Member:		
Limestone, light gray, shaly.....	191.0	192.8

Admire Group:

Hamlin Formation:

Shale, light gray, silty, calcareous.....	192.8	198.8
Shale, reddish brown, clayey, silty, calcareous; light gray to light pinkish gray below 202.5 ft...	198.8	205.5
Shale, medium to dark gray, clayey, calcareous; light gray from 206.5 to 206.8 ft., greenish gray to reddish brown below 206.8 ft.....	205.5	210.8
Shale, medium to dark gray, clayey, calcareous; reddish brown to light greenish gray below 213 ft.	210.0	220.0

Test Hole #1-A-48  
(A10-5-11cc)  
Lancaster County

Location: SW SW SW sec. 11, T. 10 N., R. 5 E., approximately 651 feet north and 26 feet east of the southwest corner.  
Ground elevation: 1,303.0 ft. (a). (Emerald 7.5 min. quadrangle)  
Depth to water: 41.0 ft. (5-21-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, slightly clayey, dark brownish gray.....	0.0	1.0
Silt, slightly clayey, dark brownish buff; contains a yellow to gray tint below 2.5 ft.....	1.0	14.0
Soil, silt, slightly clayey, dark reddish brown.....	14.0	15.5
Silt, slightly clayey, tannish brown; contains a few sand and fine gravel grains.....	15.5	17.0
Till, clayey, sandy to gravelly, calcareous, light gray with some yellowish brown; contains a few limy pebbles from 20 to 25 ft., yellowish brown below 30 ft.....	17.0	37.0
Silt, slightly clayey, slightly calcareous, brown, contains some limy nodules below 40 ft.....	37.0	50.0
Silt, sandy, slightly calcareous, brownish tan; sand is very fine; contains some small limy nodules from 65 to 70 ft.....	50.0	71.0
Sand, fine to coarse with some fine gravel.....	71.0	74.0
Silt, sandy, slightly calcareous, light gray; sand is very fine; in part siltstone from 85 to 90 ft., slightly brownish tint from 90 to 95 ft.....	74.0	100.0
Silt, and sandy silt, interbedded, light gray; sand is very fine; contains some siltstone layers.....	100.0	120.0
Silt, very sandy, moderately calcareous, light gray sand is very fine; in part siltstone.....	120.0	130.0
Silt, slightly clayey, slightly sandy, moderately calcareous, light gray; sand is very fine; contains some siltstone layers below 150 ft.....	130.0	170.0
Silt, in part sandy, moderately calcareous, light to medium gray; sand is very fine; contains a sand lens from 189 to 190 ft; principally silt below 190 ft.....	170.0	216.0
Silt, dark gray to medium gray; contains a trace of carbonaceous material.....	216.0	220.0
Silt, sandy, light gray with slight brownish tint; sand is very fine.....	220.0	228.0

Cretaceous System - Lower Cretaceous Series - Dakota Group:

Sandstone, sand is fine to medium; contains some coarse sand from 235 to 239 ft; contains iron-stone layers below 239 ft.....	228.0	240.0
Sandstone, sand is very fine to medium; contains some fine gravel grains from 255 to 260 ft; sand is very coarse from 260 to 265 ft.....	240.0	280.0
Sandstone, sand is very fine to medium; contains coarser grains and thin silt layers from 287 to 290 ft.....	280.0	300.0

Test Hole #59-A-51  
(A10-5-22da)  
Lancaster County

Location: SE corner NE SE sec. 22, T. 10 N., R. 5 E., approximately  
1,400 feet north and 30 feet west of the southeast corner.  
Ground elevation: 1,195.0 ft. (t). (Emerald 7.5 min. quadrangle)  
Depth to water: 10.5 ft. (11-28-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, sandy, dark brown; sand is very fine...	0.0	1.5
Silt, slightly clayey, dark brown.....	1.5	6.0
Silt, slightly clayey, sandy, medium brown; sand is very fine; contains slightly more sand from 10 to 16 ft; contains some shell fragments below 16 ft..	6.0	19.0
Silt, slightly clayey; contains some coarse to very coarse sand below 20 ft.....	19.0	22.0
Silt, slightly clayey, sandy, carbonaceous, black; sand is very fine.....	22.0	25.0
Silt, sandy, to silty sand, slightly clayey; sand is very fine to medium.....	25.0	27.0
Sand, medium to very coarse with a trace of fine gravel.....	27.0	28.0

Test Hole #4-B-48  
(A10-5-34ad)  
Lancaster County

Location: SE corner NE sec. 34, T. 10 N., R. 5 E., approximately  
2,543 feet south and 10 feet west of the northeast corner.  
Ground elevation: 1,320.0 ft. (t). (Emerald 7.5 min. quadrangle)  
Depth to water: Unknown; test hole caved at 12.0 ft. (5-21-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, very clayey, medium grayish brown.....	0.0	0.5
Clay, silty, reddish brown with gray tint.....	0.5	1.0
Silt, slightly clayey, reddish brown; contains some sand and gravel grains.....	1.0	4.0
Till, clay, moderately sandy to gravelly, light gray to light yellowish brown; slightly less sandy to gravelly from 5 to 6.5 ft; contains a few and weathered material below 6.5 ft.....	4.0	69.0
Till, clay, silty to slightly sandy, medium to dark gray; contains some pebbles.....	69.0	85.0
Silt, slightly clayey, moderately calcareous, light gray.....	85.0	146.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, mottled white, red, and yellow, clayey; con- tains a few thin ironstone layers from 155 to 160 ft.....	146.0	200.0



Test Hole #1-A-50  
(A10-6-5ca)  
Lancaster County

Location: NW NE SW sec. 5, T. 10 N., R. 6 E., approximately 2,340 feet north and 1,360 feet east of the southwest corner.  
Ground elevation: 1,175.0 ft. (t). (Emerald 7.5 min. quadrangle)  
Depth to water: 11.0 ft. (1-12-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	1.9
Soil, silt, moderately clayey, dark brown to black..	1.9	5.8
Silt, slightly clayey, brownish gray; moderately sandy below 7 ft; sand is very fine to medium.....	5.8	7.5
Silt, slightly clayey, sandy, brownish gray; sand is very fine to fine with some medium.....	7.5	15.5
Sand, very fine to coarse with some very coarse; contains some interbedded silt lenses from 15.5 to 18 ft; contains some fine gravel below 20 ft.....	15.5	24.6
Silt, slightly clayey, slightly sandy, light bluish gray.....	24.6	26.0
Sand, very fine to very coarse with a trace of fine gravel; sand is very fine to medium with some coarse from 27.5 to 30 ft; contains no gravel.....	26.0	35.5
Sand, very fine to coarse; sand is very fine to very coarse below 40 ft.....	35.5	46.0
Silt, slightly clayey, sandy, light gray; contains an indurated layer from 46 to 46.2 ft., light bluish gray below 52 ft., slightly calcareous below 70 ft.....	46.0	101.0
Clay, silty, slightly calcareous, light gray.....	101.0	104.5
Silt, carbonaceous, black.....	104.5	105.0
Silt, slightly clayey, slightly calcareous, light gray.....	105.0	108.0
Clay, silty, slightly calcareous, light gray.....	108.0	114.0
Silt, slightly clayey, moderately calcareous, dark brown; contains some interbedded sandy lenses.....	114.0	121.5
Sand, very fine to very coarse; contains some reworked material.....	121.5	125.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, very fine to coarse; in part moderately consolidated below 137.5 ft; sand is very fine to medium below 140 ft; contains indurated layers at 143 and 143.7 ft.....	125.0	143.5

Test Hole #1-B-50  
(A10-6-13da1)  
Lancaster County

Location: SW NE SE sec. 13, T. 10 N., R. 6 E., approximately 1,605 feet north and 1,092 feet west of the southeast corner.  
Ground elevation: 1,143.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 16.1 ft. (6-26-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, moderately clayey, dark brownish gray...	0.0	0.5
Silt, clayey, medium to dark brownish gray.....	0.5	2.0
Silt, clayey, slightly calcareous, dark brownish gray; moderately calcareous below 3 ft; contains some limy nodules and shell fragments below 4.5 ft.....	2.0	6.5
Clay, silty, slightly calcareous, medium dark brownish gray; medium brownish gray below 8.5 ft..	6.5	9.0
Clay, silty, slightly calcareous, light gray with slight yellowish brown tint.....	9.0	10.0
Silt, moderately clayey, slightly calcareous; coarse textured, light gray with yellowish brown tint; noncalcareous below 15 ft.....	10.0	17.5
Silt, clayey, medium brownish gray.....	17.5	19.0
Soil, silty, clayey, moderately calcareous, dark gray; noncalcareous below 20 ft.....	19.0	23.0
Silt, moderately clayey; in part coarse textured, light bluish gray; contains some wood fragments...	23.0	25.0
Sand, fine to medium with some coarse; sand is fine to coarse with some very coarse below 28 ft; contains more very coarse sand and iron stain below 35 ft.....	25.0	40.0
Sand, fine to very coarse with a trace of fine gravel.....	40.0	48.0
Silt, clayey, in part sandy, light brownish gray; sand is very fine.....	48.0	52.0
Sand, fine to coarse with some very coarse; sand is fine to very coarse with some fine to medium gravel below 70 ft.....	52.0	77.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, yellowish brown to white, sandy; contains a few noncalcareous rootlets.....	77.0	78.5
Sandstone; sand is fine to medium.....	78.5	80.0

Test Hole #12-A-50  
(A10-6-13da2)  
Lancaster County

Location: SW NE SE sec. 13, T. 10 N., R. 6 E., approximately 1,515 feet north and 1,265 feet west of the southeast corner.  
Ground elevation: 1,144.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 17.6 ft. (6-26-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	1.7
Soil, silt, moderately clayey, dark brownish gray...	1.7	2.5
Silt, very clayey, dark brownish gray to black.....	2.5	3.5
Soil, silt, clayey, dark brownish gray to black.....	3.5	6.0
Clay, silty, medium gray; medium gray to brown below 14.5 ft.....	6.0	20.0
Soil, silty, clayey; granular textured, black to bluish black.....	20.0	23.5
Silt, slightly clayey; coarse textured, light bluish green.....	23.5	25.5
Sand, fine to very coarse with some fine gravel; contains a peat layer below 34 ft.....	25.5	35.0
Sand and gravel, fine sand to medium gravel with some coarse gravel.....	35.0	44.3
Sand and gravel, very fine sand to coarse gravel; contains a silt lens below 47.5 ft; contains iron stain.....	44.3	50.0
Sand, very fine to coarse; contains some reworked material; sand is fine to very coarse with some fine gravel and a trace of medium gravel below 55 ft.....	50.0	60.0
Sand and gravel, fine sand to fine gravel with some medium gravel; slightly iron stained; contains slightly more medium gravel below 65 ft; contains a sandy silt layer from 66 to 67 ft.....	60.0	70.0
Sand and gravel, fine sand to fine gravel; contains some interbedded sandy silt lenses.....	70.0	80.2
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is fine to coarse.....	80.2	85.0
No sample.....	85.0	90.0

Test Hole #13-A-50  
(A10-6-13da3)  
Lancaster County

Location: SW NE SE sec. 13, T. 10 N., R. 6 E., approximately 1,665 feet north and 845 feet west of the southeast corner.  
Ground elevation: 1,143.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 15.9 ft. (6-26-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Silt, slightly clayey, dark brown to black.....	1.0	2.0
Soil, silt, clayey, black.....	2.0	3.4
Clay, slightly silty, dark grayish brown; medium grayish brown with slight iron stain below 7.5 ft.	3.4	11.0
Silt, slightly clayey, gray to dark yellowish brown contains some limy nodules to 16 ft; medium dark grayish brown below 16 ft.....	11.0	18.0
Clay, slightly silty, dark gray with slight blue tint.....	18.0	24.5
Sand, very fine to medium with some coarse; contains some fine to medium gravel below 30 ft.....	24.5	35.0
Sand and gravel, very fine sand to medium gravel; mostly medium sand to fine gravel below 40 ft; contains some interbedded silty sand layer below 50 ft.....	35.0	65.5
Silt, sandy, light brownish gray; sand is very fine.	65.5	67.0
Sand, very fine to medium with some coarse.....	67.0	76.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is very fine to medium; contains some ironstone layers and a few reworked calcareous nodules from 85 to 90 ft.....	76.0	100.0
No sample, probably sandstone.....	100.0	105.0
Sandstone, sand is very fine to medium; contains some ironstone layers to 115 ft; sand is very fine to fine below 115 ft; contains a trace of medium sand below 125 ft.....	105.0	160.0
Sandstone, sand is very fine to medium; contains some coarse sand from 174.8 to 190 ft.....	160.0	208.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Limestone, light gray.....	208.5	209.5
No sample, probably shale.....	209.5	212.5
Limestone.....	212.5	212.7

Test Hole #60-A-51  
(A10-6-13da4)  
Lancaster County

Location: NW NE SE sec. 13, T. 10 N., R. 6 E., approximately 2,590 feet north and 850 feet west of the southeast corner.  
Ground elevation: 1,143.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 15.5 ft. (11-28-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, dark brownish gray.....	0.0	3.0
Clay, silty, medium dark brownish gray.....	3.0	4.0
Soil, silt, clayey, dark brownish gray; slightly lighter color below 5 ft.....	4.0	7.5
Silt, clayey, light brownish gray; light gray with brown tint below 9.5 ft.....	7.5	10.5
Silt, fine to coarse textured, light yellowish to brownish gray.....	10.5	15.5
Silt, slightly clayey, light gray; moderately clayey below 19.2 ft., medium dark gray with some light gray below 21.5 ft.....	15.5	26.5
Sand, fine to very coarse with some fine gravel.....	26.5	30.0

Test Hole #61-A-51  
(A10-6-14cb)  
Lancaster County

Location: NW corner SW sec. 14, T. 10 N., R. 6 E., approximately  
2,540 feet north and 30 feet east of the southwest corner.  
Ground elevation: 1,155.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: Unknown.

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Fill.....	0.0	1.0
Silt, moderately clayey, black; dark brown from 2 to 3 ft., slightly more clayey and medium brown below 3 ft.....	1.0	5.0
Silt, slightly clayey, sandy, medium brown with reddish tint; sand is very fine.....	5.0	10.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, very fine to medium, iron stained.....	10.0	21.0
Shale, light gray with bluish tint, clayey.....	21.0	23.8
No sample.....	23.8	24.2
Shale, light greenish yellow, clayey; light gray with bluish tint below 27 ft.....	24.2	35.0

Test Hole #2-A-49  
(A10-6-22cc)  
Lancaster County

Location: SW SW SW sec. 22, T. 10 N., R. 6 E., approximately 55 feet north and 577 feet east of the southwest corner.  
Ground elevation: 1,159.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: Unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	0.5
Silt, sandy, dark brown to gray; sand is very fine..	0.5	1.5
Silt, sandy, reddish tan; sand is very fine to coarse.....	1.5	5.5
Sand, medium to very coarse with some fine gravel (about 5 percent gravel).....	5.5	9.5
Sand and gravel, silty; coarse sand to medium gravel	9.5	13.5
Silt, clayey, sandy to gravelly, yellowish gray.....	13.5	16.0
Clay, silty, light brownish tan with gray tint.....	16.0	21.0
Sand, very silty; sand is very fine to medium with a trace of coarse to very coarse.....	21.0	25.0
Silt, in part sandy, buff gray; sand is very fine...	25.0	30.0
Sand, fine to coarse.....	30.0	32.3
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, mottled red and gray, clayey; yellowish brown below 35 ft.....	32.3	38.0
Shale, mottled red, gray, and brown, clayey; contains a trace of silty sandstone to 40 ft., sand is very fine.....	38.0	43.0
Shale, mottled light gray and red, clayey.....	43.0	55.5
Siltstone to sandstone, light gray; sand is very fine.....	55.5	60.0

Test Hole #1-B-86  
(10-6-23dc)  
Lancaster County

Location: NW SW SW sec. 23, T. 10 N., R. 6 E., approximately  
1,500 feet west and 1,200 feet north of southeast corner.  
Ground elevation: 1,170.06 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 32.87 ft. (4-18-86).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	2.5
Silt, very clayey, brown.....	2.5	4.0
Clay, silty, dark gray; dark greenish gray below 5 ft.....	4.0	10.0
Clay, silty, sandy, dark greenish gray; sand is fine to medium.....	10.0	13.0
Sand, very fine to medium, little coarse; inter- bedded clay layer from 18 to 22 ft.....	13.0	30.0
Clay, silty, greenish gray with interbedded sand lenses.....	30.0	40.0
Sand, very fine to very coarse, rare fine gravel....	40.0	43.0
Clay, silty, grayish brown; some interbedded sand lenses.....	43.0	54.0
Sand, very fine to very coarse, little fine gravel..	54.0	55.8
Clay, silty, sandy, some interbedded silty sand; sand is very fine to medium, some coarse.....	55.8	61.0
Clay, light brownish gray; gray from 61 to 65 ft; pinkish gray, sandy below 65 ft.....	61.0	76.5
Sand, gravelly; fine sand to fine gravel.....	76.5	86.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Ironstone, sandy.....	86.0	90.0
Clay, silty, yellow stain, some sandstone.....	90.0	100.0



Test Hole #1-A-49  
(A10-6-23da1)  
Lancaster County

Location: SW NE SE sec. 23, T. 10 N., R. 6 E., approximately 1,900 feet north and 1,056 feet west of the southeast corner.  
Ground elevation: 1,180.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 40.6 ft. (4-29-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	2.0
Soil, silt, dark brownish gray.....	2.0	3.0
Silt, slightly clayey, buff gray; moderately clayey from 5 to 6 ft., limonitic below 6 ft., slightly sandy; sand is very fine to coarse below 10 ft....	3.0	13.0
Silt, moderately sandy, light buff gray; sand is very fine to very coarse.....	13.0	14/5
Sand, very silty; sand is medium to coarse with a little very coarse; slightly silty below 15 ft....	14.5	23.5
Sand, silty, to sandy silt, slightly clayey, buff gray; sand is very fine to coarse.....	23.5	25.0
Sand, fine to coarse.....	25.0	31.0
Silt, slightly sandy, light gray.....	31.0	32.0
Sand, very fine to medium with a little coarse, brownish gray with some iron stain.....	32.0	36.0
Silt, sandy, light gray; sand is very fine to medium; dark gray below 39 ft.....	36.0	42.0
Sand and gravel, fine sand to medium gravel.....	42.0	44.5
Silt, clayey, in part sandy, light gray; contains iron stain; moderately sandy below 50 ft.....	44.5	51.0
Sand and gravel, fine sand to fine gravel with a little medium gravel; contains iron stain.....	51.0	56.0
Sand, very fine to coarse.....	56.0	58.5
Silt, clayey to sandy, light gray; sand is very fine; contains some gravel grains below 60 ft.....	58.5	82.0
Sand, fine to very coarse.....	82.0	84.5
Silt, sandy, light gray; sand is very fine to fine; contains some iron stain; contains some wood fragments from 90 to 94 ft., light buff gray below 94 ft.....	84.5	97.0
Sand and gravel, medium sand to medium gravel; heterogeneous.....	97.0	100.5
Silt, sandy, light gray; sand is very fine.....	100.5	105.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, moderately consolidated, iron cemented; sand is medium to very coarse; slightly coarser and contains ironstone grains below 113.5 ft.....	105.0	123.0
Shale, light gray, clayey, sandy; sand is very fine.	123.0	125.0
Silt, light gray, sandy; sand is very fine to fine..	125.0	130.0

Shale, light grayish yellow, in part clayey, sandy; sand is very fine.....	130.0	135.0
Sandstone, in part silty; sand is very fine to medium.....	135.0	140.0
Sandstone, sand is very fine to medium with a trace of coarse; slightly coarser below 145 ft.....	140.0	148.0
Silt, light gray, clayey; contains some iron stain; sandy below 150 ft., sand is very fine to coarse..	148.0	152.0
Sandstone, sand is very fine to coarse; contains some fine sand with some coarser grains; contains some reworked material below 180 ft.....	152.0	190.0
Sandstone, sand is very fine to coarse; contains some reworked material.....	190.0	206.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, medium dark gray, silty, clayey.....	206.5	224.0

Test Hole #2-A-50  
(A10-6-23da2)  
Lancaster County

Location: NE NE SE sec. 23, T. 10 N., R. 6 E., approximately 2,499 feet north and 368 feet west of the southeast corner.  
Ground elevation: 1,173.0 ft. (i). (Lincoln 7.5 min. quadrangle)  
Depth to water: 33.3 ft. (4-28-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	0.5
Silt, slightly clayey, dark brown.....	0.5	2.5
Silt, slightly clayey, sandy, black; sand is very fine to medium.....	2.5	3.0
Sand, very fine to medium with a trace of coarse....	3.0	7.5
Sand, silty; sand is very fine to medium; slightly less silty and contains some coarse sand below 10 ft; contains some interbedded light gray silt layers below 25 ft.....	7.5	30.0
Sand, very fine to fine with some medium.....	30.0	32.8
Silt, sandy, light to darkish gray; sand is very fine to fine; brown to light gray from 33 to 38.2 ft.; light greenish gray and sand is very fine to medium below 38.2 ft.....	32.8	40.0
Sand, very fine to medium; sand is very fine to coarse below 45 ft; slightly coarser and contains a few limonitic nodules below 50 ft.....	40.0	60.0
Sand and gravel, fine sand to fine gravel; contains some limonitic grains; contains slightly less fine gravel below 70 ft.....	60.0	80.0
Silt, slightly sandy, light gray; sand is very fine. Sand, very fine to medium; sand is very fine to very coarse below 92 ft; contains some fine to medium gravel below 100 ft.....	80.0	87.0
	87.0	103.0
Cretaceous System, undifferentiated:		
Sandstone, moderately consolidated; sand is very fine to medium with some coarse; contains some very coarse grains below 110 ft.....	103.0	130.0
Sandstone, poorly consolidated; sand is very fine to medium with some coarse; contains no coarse sand below 142.5 ft.....	130.0	145.0
Sandstone, poorly consolidated; sand is very fine to medium with some coarse; contains no coarse sand below 148.5 ft.....	145.0	157.5
Ironstone.....	157.5	157.8

Test Hole #62-A-51  
(A10-6-34ca)  
Lancaster County

Location: NW NE SW sec. 34, T. 10 N., R. 6 E., approximately 2,610 feet north and 1,770 feet east of the southwest corner.  
Ground elevation: 1,150 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 15.6 ft. (12-10-51).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, dark brown; granular textured.....	0.0	2.5
Silt, slightly clayey, dark brown; slightly lighter color from 5 to 6.5 ft., moderately clayey, medium brown below 6.5 ft.....	2.5	13.1
Silt, moderately clayey, dark gray; medium gray below 16.5 ft.....	13.1	17.0
Sand, fine to coarse with some very coarse.....	17.0	23.0
Silt, slightly clayey; coarse textured, sandy, light brown; sand is very fine; slightly coarser below 26 ft.....	23.0	29.0
Sand, fine to very coarse with a trace of gravel....	29.0	36.0
Clay, silty, light yellowish brown.....	36.0	40.0

Test Hole #3-B-49  
(A10-6-35ba1)  
Lancaster County

Location: NW NE NW sec. 35, T. 10 N., R. 6 E., approximately 633 feet south and 1,750 feet east of the northwest corner.  
Ground elevation: 1,161.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 16.6 ft. (7-5-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brown.....	0.0	0.5
Silt, clayey, slightly sandy, pale brown; sand is very fine to fine; contains a few limy grains.....	0.5	3.5
Sand, silty; sand is very fine to medium; contains no silt below 4 ft.....	3.5	6.0
Silt, clayey, moderately sandy, grayish brown; sand is very fine to fine; slightly less sandy and dark grayish brown below 8 ft.....	6.0	9.0
Silt, moderately clayey, moderately sandy, dark grayish brown; sand is very fine to fine; slightly clayey, very sandy, brown; sand is very fine to medium below 10 ft.....	9.0	12.5
Sand, fine to medium.....	12.5	13.5
Sand, silty; sand is very fine to fine with some medium.....	13.5	14.0
Silt, slightly clayey, sandy, light gray; sand is very fine to fine; moderately clayey and contains some medium sand below 16 ft.....	14.0	17.5
Silt, sandy, slightly clayey, pale brown; sand is fine.....	17.5	20.0
Silt, slightly clayey, moderately sandy, light gray; sand is very fine to medium with a little coarse.....	20.0	21.5
Sand, fine to very coarse with some fine gravel (10 percent gravel).....	21.5	24.0
Clay, silty, light brownish gray; contains a trace of fine to coarse sand.....	24.0	25.0
Clay, silty, moderately calcareous, pale brown.....	25.0	28.0
Clay, silty, slightly sandy, moderately calcareous, gray; sand is very fine to fine.....	28.0	30.5
Sand, fine to very coarse; contains no very coarse sand from 35 to 40 ft; contains a few gravel grains below 40 ft.....	30.5	43.5
Clay, silty, gray.....	43.5	44.0
Clay, silty, dark gray; contains some limonitic grains; slightly sandy with pinkish tint; sand is very fine below 50 ft.....	44.0	55.0
Sand, medium to coarse with some fine.....	55.0	58.5
Sand, fine to very coarse with some fine gravel (10 percent gravel); contains a silt layer at 62 ft....	58.5	75.0

Sand, gravelly; fine sand to fine gravel (25 per- cent gravel).....	75.0	79.0
Clay, silty, slightly sandy, gray; sand is very fine.....	79.0	81.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, medium grained, iron stained.....	81.0	91.5
Shale, light yellowish brown, clayey.....	91.5	95.0
Sandstone, sand is medium to very coarse; contains a few coarser grains below 105 ft.....	95.0	110.0
Sandstone, moderately consolidated; sand is medium..	110.0	120.0

Test Hole #4-B-49  
(A10-6-35ba2)  
Lancaster County

Location: NE NW NW sec. 35, T. 10 N., R. 6 E., approximately 633 feet south and 1,700 feet east of the northwest corner.  
Ground elevation: 1,152.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 8.0 ft. (6-25-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, dark brown.....	0.0	1.5
Silt, slightly clayey, dark grayish brown.....	1.5	5.0
Silt, moderately clayey, dark gray; some medium gray below 8 ft.....	5.0	10.0
Silt, clayey, gray; contains some fine sand below 15 ft.....	10.0	18.0
Sand, fine to coarse.....	18.0	20.0
Sand, fine to coarse with some fine gravel (10 percent gravel).....	20.0	25.0
Sand and gravel, fine sand to fine gravel (50 percent gravel); contains 20 percent gravel from 30 to 35 ft.....	25.0	37.0
Silt, clayey, dark gray.....	37.0	44.0
Silt, moderately sandy, pale brown; sand is very fine.....	44.0	46.0
Sand, fine to medium.....	46.0	52.0
Sand, gravelly; fine sand to fine gravel (15 percent gravel).....	52.0	55.0
Silt, slightly clayey, slightly sandy, light gray; sand is very fine.....	55.0	60.0
Sand, gravelly; fine sand to fine gravel (25 percent gravel).....	60.0	65.0
Sand and gravel, fine sand to fine gravel (50 percent gravel).....	65.0	70.0
Sand, fine to very coarse.....	70.0	71.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, medium grained.....	71.5	80.0
Shale, dark brown, silty, clayey.....	80.0	81.5
Sandstone, medium to coarse grained; in part silty below 85 ft.....	81.5	90.0
Shale, black, clayey.....	90.0	95.5
Sandstone, fine to medium grained.....	95.5	100.0
Sandstone, medium grained.....	100.0	115.0
Sandstone, sand is fine to very coarse; contains an indurated layer from 115.5 to 116.5 ft.....	115.0	120.0
Sandstone, well consolidated; sand is medium with some coarse; poorly consolidated, sand is medium to coarse with some very coarse below 123 ft.....	120.0	125.0

Sandstone, in part silty; sand is fine to medium with some coarse; sand is coarse to very coarse below 125.5 ft.....	125.0	129.5
Sandstone, fine to medium grained, in part silty....	129.5	150.0
Sandstone, medium to coarse grained.....	150.0	155.0
Sandstone, fine to very coarse grained.....	155.0	160.0
Sandstone, medium grained.....	160.0	172.5
Shale, white, clayey.....	172.5	176.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, dark gray, clayey, silty; contains a trace of carbonaceous material, medium gray below 180 ft; contains a little mottled reddish brown below 195 ft.....	176.5	200.0



Test Hole #8-B-49  
(A10-7-1ad)  
Lancaster County

Location: NE SE NE sec. 1, T. 10 N., R. 7 E., approximately 1,686 feet south and 10 feet west of the northeast corner.  
Ground elevation: 1,239.0 ft. (a). (Walton 7.5 min. quadrangle)  
Depth to water: 74.5 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.5
Silt, clayey, dark brown.....	1.5	2.5
Silt, clayey, medium brown; dark brownish buff below 15.5 ft.....	2.5	16.5
Silt, clayey, dark brown; slight reddish tint below 20 ft.....	16.5	22.5
Till, clayey, silty, sandy to slightly pebbly, tannish brown; moderately calcareous below 23.5 ft., light brownish gray from 23.5 to 24.5 ft., light yellowish gray below 24.5 ft.....	22.5	35.0
Silt, very sandy, moderately calcareous, brownish gray; sand is very fine; contains some pebbles....	35.0	40.0
Till, clayey, silty, sandy to pebbly, dark brown; slightly light color and contains much sandy silt below 45 ft.....	40.0	50.0
Till, clayey, silty, sandy to pebbly, moderately calcareous, brownish gray; yellowish brown below 58 ft.....	50.0	63.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Clay, brownish gray with some yellowish brown, silty; contains some interbedded sandstone layers.....	63.0	66.0
Sand, medium to coarse.....	66.0	68.0
Sandstone, moderately consolidated; sand is fine to medium; sand is very fine from 70 to 76.5 ft; contains some fine to coarse sand below 80 ft.....	68.0	84.0
Shale, medium gray, clayey, silty; very sandy, sand is very fine below 85 ft.....	84.0	85.5
Sand, in part moderately consolidated; sand is very fine to fine; contains light gray shale layers from 87 to 87.5 ft., and below 89.5 ft.....	85.5	91.0
Sandstone, moderately consolidated; sand is coarse to very coarse; contains some ironstone layers below 95.5 ft.....	91.0	96.0
Sandstone, moderately consolidated; sand is medium to coarse; contains some thin clayey shale lenses; contains some fine grained sandstone below 105 ft.	96.0	122.0
Sandstone, coarse grained.....	122.0	128.0
Shale, gray, clayey, silty; contains some sandstone lenses.....	128.0	132.5

Sandstone to ironstone, moderately consolidated.....	132.5	135.0
Sandstone, fine to medium grained; contains some ironstone grains and weathered shale lenses.....	135.0	160.0
Shale, greenish gray, clayey, silty, moderately calcareous, sandy; sand is very fine.....	160.0	168.0
Sandstone, medium grained, in part moderately consolidated.....	168.0	172.0
Shale, greenish gray, clayey, silty, sandy; sand is very fine; contains a sandstone lens; sand is medium to coarse from 173 to 173.5 ft., shale is red and white below 173.5 ft.....	172.0	175.0
Sandstone, moderately consolidated; sand is medium with some coarse; contains some ironstone grains; contains some fine sand from 180 to 185 ft.....	175.0	188.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, yellow to light gray, clayey; slightly calcareous below 199.5 ft.....	188.0	199.9
Shale, dark gray to black, clayey, in part weathered	199.9	201.5
Limestone, medium gray.....	201.5	202.0

Test Hole #21-B-46  
(A10-7-3cd)  
Lancaster County

Location: SW SE SW sec. 3, T. 10 N., R. 7 E., approximately 27 feet  
north and 1,840 feet east of the southwest corner.  
Ground elevation: 1,165.0 ft. (a). (Walton 7.5 min. quadrangle)  
Depth to water: 37.2 ft. (6-14-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, brown.....	0.0	1.5
Clay, silty, medium brown.....	1.5	3.0
Silt, clayey, light brown to buff; light grayish buff below 5 ft.....	3.0	10.5
Sand, fine to coarse, silty.....	10.5	16.5
Silt, clayey, sandy, light to dark brown with some pink.....	16.5	20.0
Clay, silty, sandy, reddish brown.....	20.0	35.0
Clay, silty, light gray.....	35.0	41.0
Sand; fine to coarse with some fine gravel.....	41.0	45.0
Sand and gravel, fine sand to fine gravel; contains some reworked sandstone and ironstone grains be- low 50 ft.....	45.0	53.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is fine to coarse with a few coarser grains.....	53.5	55.2
Shale, yellow, clayey, silty.....	55.2	58.0
Sandstone, fine to coarse grained with some coarser grains.....	58.0	60.5
Shale, yellow and gray, clayey, silty; contains some ironstone layers.....	60.5	70.0
Sandstone, fine to coarse grained.....	70.0	76.5
Shale, gray, silty; contains interbedded ironstone layers.....	76.5	81.0
Sandstone, fine to medium grained; contains iron- stone layers at 82.5 and 84 ft.....	81.0	90.0
Shale, red, white, and light gray.....	90.0	92.7
Shale, medium to dark gray; contains some red and light gray below 95 ft; contains ironstone layers at 97.8 and 100 ft.....	92.7	100.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Limestone, light gray; cherty to 101.2 ft.....	100.0	105.2
Limestone to limy shale, light gray.....	105.2	106.4
Shale, dark gray.....	106.4	109.0
Shale, red and light bluish green, clayey.....	109.0	114.0
Limestone to limy shale, light gray to green.....	114.0	124.5
Shale, dark gray, clayey.....	124.5	127.8
Limestone, gray.....	127.8	128.0

Test Hole #22-B-46  
(A10-7-4ad)  
Lancaster County

Location: Center east line sec. 4, T. 10 N., R. 7 E., approximately  
2,640 feet south and 26 feet west of the northeast corner.  
Ground elevation: 1,145.0 ft. (t). (Walton 7.5 min. quadrangle)  
Depth to water: 24.2 ft. (6-18-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, dark brown.....	0.0	1.0
Clay, silty, grayish brown.....	1.0	2.5
Silt, slightly clayey, light brownish tan to buff...	2.5	16.0
Sand, silty, to sandy silt, medium brown.....	16.0	18.0
Sand, silty, light reddish brown; light brownish pink below 20 ft.....	18.0	21.0
Silt, sandy, light reddish brown; light brownish pink below 25 ft.....	21.0	27.0
Sand, gravelly; medium to coarse sand with some gravel.....	27.0	30.0
Sand, fine to coarse; sand is fine to medium with some coarse below 35 ft.....	30.0	40.0
Clay, silty, light gray.....	40.0	49.5
Sand and gravel, medium sand to fine gravel; con- tains coarse gravel at 55 ft.....	49.5	59.5
Sand and gravel, fine sand to fine gravel with some coarse gravel below 68 ft.....	59.5	70.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, medium to coarse grained; sand is medium to very coarse from 80 to 90 ft; contains an ironstone layer from 97.5 to 100 ft.....	70.0	100.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, brownish yellow to gray, clayey.....	100.5	102.0
Shale, dark gray, clayey.....	102.0	102.9
Limestone, light gray.....	102.9	103.4

Test Hole #7-A-73  
(10-7-4bc)  
Lancaster County

Location: SW SW NW sec. 4, T. 10 N., R. 7 E., approximately 2,340 feet south and 20 feet east of the northwest corner.  
Ground elevation: 1,140.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 9.89 ft. (8-29-73).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Roadfill.....	0.0	2.8
Clay, silty, olive brown; yellowish brown below 7 ft; trace of sand, little fine gravel.....	2.8	10.0
Silt, slightly clayey, sandy, yellow to olive brown.	10.0	16.0
Sand, very fine to very coarse; trace of gravel below 25 ft.....	16.0	30.0
Sand and gravel, fine sand to coarse gravel; silt layer at 48 ft, silty below 50 ft.....	30.0	51.5
Sand and gravel, very fine sand to coarse gravel, some silt lenses.....	51.5	65.0
Sand and gravel, fine sand to medium gravel.....	65.0	70.0
Sand, very fine to coarse, in part iron cemented....	70.0	74.8
Sand, very fine to medium.....	74.8	95.7
Sand and gravel, fine sand to medium gravel.....	95.7	105.0
Sand, medium to very coarse.....	105.0	107.5
Clay, silty, light yellowish brown; light gray to gray below 110 ft; some sand and gravel below 120 ft.....	107.5	125.9
Clay, silty, dark reddish brown; little fine gravel; gray below 127.6 ft.....	125.9	130.0

Test Hole #3-A-51  
(A10-7-5ad)  
Lancaster County

Location: NE SE NE sec. 5, T. 10 N., R. 7 E., approximately 1,560 feet south and 18 feet west of the northeast corner.  
Ground elevation: 1,139.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 8.6 ft. (6-29-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	2.0
Soil, silt, clayey, dark gray to dark brownish gray.	2.0	2.5
Silt, clayey, medium brown.....	2.5	3.5
Clay, silty, light to medium brown.....	3.5	6.5
Silt, moderately clayey, light yellowish brown; contains limy nodules below 10 ft.....	6.5	15.0
Silt, slightly sandy, yellowish brown.....	15.0	18.5
Sand, very fine to medium; iron stained.....	18.5	20.0
Silt, sandy, light gray; sand is very fine; con- tains iron stain.....	20.0	25.5
Sand, very fine to coarse; sand if very fine to very coarse with a trace of fine gravel below 31 ft....	25.5	34.0
Soil, silt, clayey, dark brown.....	34.0	35.0
Sand and gravel, fine sand to fine gravel.....	35.0	39.5
Clay, silty, slightly sandy, light yellowish brown..	39.5	41.0
Sand and gravel, fine sand to fine gravel; contains clay balls below 46 ft.....	41.0	49.0
Silt, sandy, medium gray; sand is very fine.....	49.0	50.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, very fine grained; iron stained; sand is very fine to medium below 60 ft.....	50.0	95.0
Sand, medium to coarse; sand is medium to very coarse below 100 ft.....	95.0	106.0
Shale, light gray, silty, sandy; sand is very fine; contains iron stain.....	106.0	114.0
Shale, light gray to reddish gray, clayey.....	114.0	117.5
Sandstone, well consolidated; sand is very fine to coarse.....	117.5	120.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, medium to dark gray, clayey; light gray below 121 ft.....	120.0	125.0
Siltstone, medium gray, clayey.....	125.0	127.0
Shale, light gray, silty, clayey; contains some silt stone to 128 ft.....	127.0	129.7
Limestone, medium gray.....	129.7	131.5
Shale, medium to dark gray, clayey; contains some light gray below 133 ft.....	131.5	134.9
Limestone, light gray; shaly from 137 to 139.5 ft...	134.9	140.0

Test Hole #14-A-50  
(A10-7-5db)  
Lancaster County

Location: NW NW SE sec. 5, T. 10 N., R. 7 E., approximately 458 feet south and 648 feet east of the center of the section.  
Ground elevation: 1,140.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 17.6 ft. (7-30-50).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt; coarse textured, medium dark brownish gray; contains some very fine to fine sand.....	0.0	0.5
Soil, silt, clayey; granular textured, dark brownish gray.....	0.5	1.5
Silt, clayey; granular textured, medium brown; contains some yellowish brown below 2.5 ft; contains some limy nodules from 2.5 to 5 ft; contains some iron stain below 5 ft; contains some very fine to fine sand below 7 ft.....	1.5	10.0
Silt, slightly clayey, slightly sandy, light yellow to grayish brown; sand is very fine to medium; very sandy below 14 ft; sand is very fine to medium with a trace of coarse.....	10.0	15.0
Sand, fine to coarse; slightly finer grained from 17 to 35 ft.....	15.0	38.0
Silt, clayey to sandy, medium dark yellowish brown..	38.0	40.0
Sand, very fine to coarse; slightly coarser below 45 ft.....	40.0	50.0

Test Hole #2-A-51  
(A10-7-5dd)  
Lancaster County

Location: NE SE SE sec. 5, T. 10 N., R. 7 E., approximately 1,237 feet north and 18 feet west of the southeast corner.  
Ground elevation: 1,142.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 13.4 ft. (6-27-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	1.5
Soil, silt, clayey, dark brown, dark brownish gray below 2 ft.....	1.5	3.0
Silt, clayey, light yellowish brown; slightly clayey below 10 ft.....	3.0	17.0
Sand, very fine to coarse with some medium.....	17.0	20.0
Sand, very silty; sand is very fine to coarse; slightly silty below 22 ft.....	20.0	25.0
Sand, very fine to coarse; contains thin silt layers at 27.2 and 52 ft; sand is very fine to coarse with a trace of fine gravel below 27.2 ft; contains some iron stain below 47 ft.....	25.0	78.0
Silt, clayey, sandy, light gray; sand is very fine..	78.0	80.5
Sand and gravel, medium sand to fine gravel; contains some ironstone fragments (65 percent gravel); contains some very fine sand from 100 to 105 ft; contains some light gray clay layers from 110 to 115 ft; contains 50 percent gravel below 110 ft.....	80.5	123.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, light gray, clayey.....	123.0	125.0
Sandstone, silty; sand is very fine.....	125.0	130.9
Shale, yellowish brown with some reddish brown and medium gray, clayey.....	130.9	133.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, greenish gray to grayish black, clayey.....	133.5	134.8
No sample.....	134.8	135.0



Test Hole #4-A-73  
(10-7-5ac)  
Lancaster County

Location: SW corner NE sec. 5, T. 10 N., R. 7 E., approximately  
2,637 feet south and 2,561 feet west of the northeast corner.  
Ground elevation: 1,138.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, moderately clayey, black; brownish black below 3.8 ft.....	0.0	7.2
Silt, slightly clayey, slightly sandy, brownish black, in part black; sand is very fine; contains some sandstone and shell fragments.....	7.2	12.0
Clay, silty, slightly sandy, black; sand is very fine to fine; grayish green from 25.5 to 28 ft....	12.0	30.0
Sand and gravel, very fine sand to fine gravel; some clay seams.....	30.0	35.0
Sand and gravel, very fine sand to fine gravel, much Dakota fragments; coarser texture below 40 ft.....	35.0	48.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, very fine to coarse; moderately silty be- low 60 ft; trace of fine gravel.....	48.0	65.0
Sandstone, very fine to very coarse with a trace of fine gravel; some shale fragments and iron cement- ed sandstone below 70 ft.....	65.0	110.0

Test Hole #6-A-73  
(10-7-5ab)  
Lancaster County

Location: NW NW NE sec. 5, T. 10 N., R. 7 E., approximately 2,560 feet west and 232 feet south of the northeast corner.  
Ground elevation: 1,138.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, very clayey, dark brownish black; black below 3 ft.....	0.0	8.0
Silt, moderately clayey, dark brown.....	8.0	14.5
Sand, very fine to coarse.....	14.5	18.0
Clay, silty, dark olive gray; dark greenish gray below 20 ft.....	18.0	25.0
Silt, moderately clayey, black.....	25.0	32.0
Sand, very fine to very coarse; trace of fine gravel	32.0	35.0
Sand and gravel, moderately silty; fine sand to medium gravel.....	35.0	40.0
Clay, moderately silty, gray.....	40.0	42.0
Sand, moderately silty; sand is fine to very coarse, trace of fine gravel; slightly silty below 45 ft; no fine gravel below 55 ft.....	42.0	59.0
Clay, silty, moderately sandy, gray; sand is very fine to medium; no sand below 75 ft; dark gray below 85 ft.....	59.0	93.0
Sand, very fine to very coarse; trace of fine gravel	93.0	100.0
Sand and gravel, fine sand to fine gravel, much ironstone fragments; trace of medium gravel below 105 ft.....	100.0	110.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine to very coarse, trace of fine gravel, much shale fragments.....	110.0	130.0

Test Hole #8-A-73  
(10-7-6aa)  
Lancaster County

Location: NE NE NE sec. 6, T. 10 N., R. 7 E., approximately 305 feet south and 107 feet west of the northeast corner.  
Ground elevation: 1,136.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, black; less clay below 1 ft....	0.0	1.8
Silt, moderately clayey, slightly sandy, very dark gray; sand is very fine.....	1.8	4.0
Silt, moderately clayey, black; some yellow stain...	4.0	11.0
Clay, slightly silty, grayish black; olive to olive gray from 14 to 17 ft.....	11.0	25.5
Clay, very silty, moderately sandy, greenish gray; sand is fine to medium.....	25.5	28.0
Sand and gravel, fine sand to fine gravel.....	28.0	44.0
Clay, silty, olive gray.....	44.0	47.0
Sand, very fine to very coarse; slightly silty with a trace of fine gravel from 50 to 55 ft; moderately silty below 60 ft.....	47.0	63.0
Clay, moderately silty, moderately sandy, grayish green; olive gray below 65 ft.....	63.0	67.0
Sand and gravel, fine sand to fine gravel; trace of moderate gravel.....	67.0	72.0
Clay, moderately silty, gray; grayish black from 75 to 80 ft.....	72.0	82.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, very fine to very coarse; trace of fine gravel and some ironstone fragments below 90 ft.....	82.0	100.0
Sand, gravelly; very fine sand to fine gravel; trace of medium gravel; some shale fragments.....	100.0	108.0
Sandstone, very fine to fine; in part iron cemented; much shale from 120 to 125 ft; fine to medium sand below 125 ft.....	108.0	129.0
Silt, pale brownish white, moderately clayey, slightly sandy.....	129.0	130.0

Test Hole #20-B-46  
(A10-7-10dd)  
Lancaster County

Location: SE SE SE sec. 10, T. 10 N., R. 7 E., approximately 118 feet north and 8 feet west of the southeast corner.  
Ground elevation: 1,232.0 ft. (a). (Walton 7.5 min. quadrangle)  
Depth to water: 36.8 ft. (6-14-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, dark brown.....	0.0	1.0
Clay, silty, medium dark brownish gray.....	1.0	3.0
Silt, clayey, light brown to buff.....	3.0	14.0
Clay, silty, sandy, dark reddish brown; slightly lighter color below 18 ft.....	14.0	20.0
Clay, sandy, reddish brown and gray.....	20.0	24.5
Till, clay, sandy to gravelly with some pebbles, yellowish brown and gray.....	24.5	70.0
Clay, silty, sandy, yellowish brown to gray; very sandy below 72.5 ft.....	70.0	80.0
Sand, fine to coarse; contains some interbedded clayey silt layers.....	80.0	90.5
Clay, silty, yellowish gray; medium to dark gray below 92.5 ft.....	90.5	95.0
Clay, silty, sandy, medium to dark gray.....	95.0	110.0
Silt, clayey, to silty clay, moderately calcareous, medium to dark gray.....	110.0	146.0
Sand, silty, to sandy silt, light brown to tan.....	146.0	148.0
Sand, fine to coarse with some gravel; iron stained; contains some reworked material.....	148.0	158.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Ironstone and sandstone, well consolidated.....	158.0	160.0
Gravel, slightly consolidated.....	160.0	162.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, light bluish green, clayey.....	162.0	167.5
Shale, red and bluish green, silty.....	167.5	171.0
Shale, light gray to green with bluish tint, silty; in part micaceous.....	171.0	176.0
Shale, medium gray, clayey; dark gray below 180 ft..	176.0	186.0
Limestone, light gray; shaly from 186.2 to 186.4 ft.	186.0	186.8
Shale, dark gray.....	186.8	187.3
Limestone, light gray.....	187.3	187.5
Shale, dark gray.....	187.5	188.2
Limestone, light gray.....	188.2	190.0

Test Hole #6-B-49  
(A10-7-12dd)  
Lancaster County

Location: SE SE SE sec. 12, T. 10 N., R. 7 E., approximately 117 feet north and 17 feet west of the southeast corner.  
Ground elevation: 1,217.0 ft. (a). (Walton 7.5 min. quadrangle)  
Depth to water: Unknown; test hole caved at 56.0 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil and road fill.....	0.0	1.0
Soil, silty clayey, dark brown.....	1.0	2.0
Silt, clayey, medium brown; dark brown from 4.5 to 11 ft.....	2.0	13.5
Silt, clayey, slightly sandy, dark brown; sand is fine.....	13.5	17.5
Till, clayey, silty, sandy to pebbly, medium brown; contains some brownish yellow below 18 ft.....	17.5	22.0
Till, clayey, silty, sandy to pebbly, moderately calcareous, light brownish gray; pale yellow below 25 ft.....	22.0	30.0
Silt, very clayey, sandy, moderately calcareous, yellowish brown with a little light gray.....	30.0	34.5
Sand, coarse to very coarse with some pebbles.....	34.5	45.0
Sand and gravel, very coarse sand to fine gravel; contains some coarse sand.....	45.0	50.0
Sand, coarse to very coarse with some fine gravel...	50.0	58.5
Silt, clayey, medium brownish gray.....	58.5	60.0
Till, clayey, silty, sandy to pebbly, slightly calcareous, medium gray; contains sandy layers at 92 and 94 ft.....	60.0	130.5
Sand, fine to medium; sand is medium to coarse with some very coarse below 140 ft.....	130.5	148.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine grained; contains some ironstone grains.....	148.0	150.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, light yellowish brown, clayey, moderately calcareous; in part weathered; contains medium gray siltstone below 151 ft.....	150.0	152.0
Shale, dark gray to black, clayey, slightly calcareous; in part weathered; varicolored below 155 ft.	152.0	158.0
Limestone, greenish gray, shaly.....	158.0	160.0
Shale, medium gray, clayey, very calcareous.....	160.0	162.5
Shale, dark gray, clayey, very calcareous; moderately calcareous below 165 ft.....	162.5	175.0
Limestone, medium gray, shaly.....	175.0	175.5
Shale, dark gray to black, clayey.....	175.5	180.0

Test Hole #1-A-59  
(A10-7-18dc)  
Lancaster County

Location: SW SW SE sec. 18, T. 10 N., R. 7 E., approximately 568 feet north and 2,503 feet west of the southeast corner.  
Ground elevation: 1,155.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 7.5 ft. (5-27-59).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey; coarse textured, very dark brown.....	0.0	2.5
Silt, moderately clayey; coarse textured, medium brown; very clayey from 7.7 to 9.4 ft; light brown below 9.4 ft.....	2.5	10.0
Silt, very clayey; coarse textured, light yellowish gray; contains iron stains; sandy, sand is very fine below 15 ft.....	10.0	18.2
Silt, slightly clayey, very sandy, medium brownish yellow; sand is very fine.....	18.2	18.5
Sand and gravel, fine sand to medium gravel (75 percent gravel).....	18.5	20.0
Sand, very fine to coarse with some very coarse.....	20.0	22.3
Silt, moderately clayey, sandy; coarse textured, medium brown; sand is very fine; contains iron stain; very clayey, very sandy, sand is very fine to fine from 25 to 30 ft.....	22.3	31.5
Silt, slightly clayey, very sandy, medium brown; sand is fine to very coarse with some fine gravel; moderately clayey, moderately sandy, sand is very fine to fine; contains no gravel below 33 ft.....	31.5	36.2
Sand, silty, slightly clayey; sand is fine to very coarse; contains some fine to medium gravel (25 percent gravel).....	36.2	40.0
Sand, slightly silty; sand is very fine to coarse with some very coarse.....	40.0	41.8
Silt, moderately clayey, moderately sandy, medium brown; sand is very fine to fine.....	41.8	43.0
Silt, very clayey; coarse textured, light brownish gray.....	43.0	47.0
Sand, silty; sand is very fine to very coarse with a trace of fine gravel.....	47.0	50.0
Sand, fine to coarse with some very coarse; contains some medium to coarse gravel (40 percent gravel); contains some interbedded silty clay layers.....	50.0	55.0

Sand, very fine to coarse with some very coarse; contains some fine gravel; contains a peaty layer at 58 ft.....	55.0	60.0
Silt, moderately clayey; coarse textured to sandy, light yellowish gray; sand is very fine; contains iron stain; contains a dark gray clayey silt layer from 60 to 60.2 ft.....	60.0	64.0
Sand, very fine to coarse with some very coarse; contains some sandstone and shale fragments; contains some silty lenses below 70 ft.....	64.0	74.8
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is very fine to medium with some coarse; contains some iron stain; slightly silty below 80 ft.....	74.8	85.0
Sandstone, sand is very fine to coarse with some very coarse; contains many reworked shale frag- ments.....	85.0	97.3
Shale, light gray, clayey.....	97.3	98.3
Shale and sandstone, light gray, interbedded; sand is very fine to fine.....	98.3	99.0
Sandstone, sand is very fine to fine.....	99.0	116.0
Sandstone, sand is very fine to very coarse with a trace of fine gravel; contains some iron stain; sand is very fine to medium with some coarse from 120 to 133 ft; contains a silt lens from 126.6 to 126.7 ft; sand is very fine to coarse with some very coarse below 133 ft.....	116.0	135.0
Shale, light yellow, clayey.....	135.0	136.3
Sandstone, sand is very fine to coarse; contains silty lenses from 137.5 to 137.6 and at 145.8 to 146.7 ft; sand is very fine to medium with some coarse below 145 ft.....	136.3	160.0
Sandstone, sand is very fine to fine with some medium.....	160.0	164.3
Shale, light yellow, clayey.....	164.3	165.0
Sandstone, sand is very fine to fine with some medium; slightly clayey from 167.5 to 167.7 ft; contains some reworked material below 185 ft.....	165.0	188.7
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, light brownish yellow, clayey.....	188.7	191.0
Shale, medium olive yellow, clayey.....	191.0	192.7
Shale, reddish brown, clayey.....	192.7	193.6
Shale, olive yellow, clayey.....	193.6	194.3
Shale, light bluish gray, clayey.....	194.3	194.8
Limestone, light gray, cherty.....	194.8	196.0

Test Hole #1-B-91  
(A10-7-18dbca)  
Lancaster County

Location: NE SW NW SE sec. 18, T. 10 N., R. 7 E., just north of building.

Ground elevation: 1,160 ft. (t). (Lincoln 7.5 min. quadrangle)

Depth to water: 19.0 ft. Electric log. (Casing set at 197.0').

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil.....	0.0	2.5
Clay, brown.....	2.5	10.0
Clay, gray.....	10.0	15.0
Clay, grayish brown.....	15.0	20.0
Silt, brown to grayish brown, slightly sandy.....	20.0	46.0
Sand, fine to coarse grained.....	46.0	55.0
Sand, medium sand to fine gravel.....	55.0	57.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, orange, medium sand to fine gravel.....	57.0	60.0
Sand, orange, medium to coarse grained.....	60.0	70.0
Sand, fine to medium grained	70.0	90.0
Sandstone, brown, fine to medium grained; contains some interbedded white siltstone.....	90.0	110.0
Sand to sandstone, orange, medium grained, coarser at bottom.....	110.0	155.0
Sandstone, fine grained and interbedded siltstone....	155.0	166.5
Silt, gray.....	166.5	168.5
Silt, brown, white siltstone and fine to medium grained sand.....	168.5	190.0
Siltstone, white and brown shaly clay.....	190.0	194.8
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, gray, with interbedded limestone.....	194.8	200.0
Shale, red at top, green towards bottom.....	200.0	217.5
Shale, medium to dark gray.....	217.5	255.0
Shale, black.....	255.0	255.5
Shale, medium gray.....	255.5	269.5
Shale, brownish red.....	269.5	270.5
Shale, medium gray, soft, hard zones at 308.5-308.9, 312-312.5, 316.5-316.7, 316.8-316.9.....	270.5	318.5
Shale, dark gray, fissile.....	318.5	322.0
Limestone, light to dark gray, shaly.....	322.0	325.5
Shale, light to dark gray.....	325.5	329.0
Shale, black, soft.....	329.0	330.0
Shawnee Group:		
Limestone, light gray with interbedded medium and dark gray shale layers.....	330.0	351.5
Shale.....	351.5	353.0



Limestone, light gray.....	353.0	358.8
Shale, very dark gray.....	358.8	359.4
Limestone, light gray.....	359.4	360.0
Shale.....	360.0	361.6
Limestone, light gray to white.....	361.6	373.0
Shale.....	373.0	373.9
Limestone.....	373.9	374.5
Shale.....	374.5	375.6
Limestone.....	375.6	377.0
Shale.....	377.0	380.5
Limestone layers and shale.....	380.5	390.0
Shale, light olive brown.....	390.0	393.0
Shale, grayish brown with a thin limestone at top....	393.0	400.0
Shale, grayish brown.....	400.0	415.0
Limestone, light gray.....	415.0	422.5
Shale.....	422.5	423.2
Limestone.....	423.2	424.5
Shale, dark reddish brown.....	424.5	432.5
Limestone.....	432.5	450.0
Limestone, light gray.....	450.0	456.0
Shale, reddish brown to bluish gray.....	456.0	458.0
Limestone with interbedded gray to bluish gray shale.	458.0	460.0
Limestone, light gray to brownish gray, fossiliferous; shaly in part; contains chert.....	460.0	470.0
Limestone, light gray to gray, fossiliferous with some dark gray inclusions.....	470.0	493.0
Shale, light gray to black.....	493.0	496.3
Limestone.....	496.3	497.7
Shale.....	497.7	499.0
Limestone.....	499.0	500.0

Test Hole #1-A-51  
(A10-7-21da)  
Lancaster County

Location: NE NW SE sec. 21, T. 10 N., R. 7 E., approximately 2,013 feet north and 1,000 feet west of the southeast corner.  
Ground elevation: 1,193.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: 8.0 ft. (6-27-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brownish gray.....	0.0	1.0
Silt, clayey, light yellowish brown; slightly calcareous below 2 ft; contains many limy nodules below 4 ft.....	1.0	8.0
Silt, moderately clayey, medium grayish brown.....	8.0	13.5
Soil, silt, moderately clayey, dark grayish brown; slightly more clayey below 15 ft.....	13.5	17.5
Silt, moderately clayey, light yellow to light gray; contains limonitic grains, slightly less clayey below 20 ft., clayey; in part brown and bluish green below 25 ft.....	17.5	27.5
Sand and gravel, in part slightly silty; fine sand to fine gravel with some medium gravel; contains no medium gravel below 31 ft.....	27.5	34.0
Silt, moderately clayey, sandy, brownish gray; sand is very fine to medium.....	34.0	37.0
Sand, silty, to sandy silt, slightly clayey, yellowish brown; sand is fine to coarse.....	37.0	39.0
Sand, fine to very coarse; contains some iron stain.	39.0	46.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, moderately consolidated; in part silty; sand is fine to coarse.....	46.5	53.5
Shale, yellowish brown and light gray, clayey; contains interbedded sandy shale and silty sandstone below 55 ft.....	53.5	63.0
Shale, light gray, sandy, micaceous.....	63.0	65.0
Ironstone layer.....	65.0	65.1
Shale, light gray, sandy.....	65.1	84.5
Ironstone layer.....	84.5	84.6
Shale, light yellowish brown, slightly sandy.....	84.6	85.1
Shale, light gray, sandy, micaceous.....	85.1	90.0
Shale, light to medium gray, sandy, micaceous; contains a trace of light gray bentonitic shale from 98 to 100 ft.....	90.0	100.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Zeandale - Willard Formations:		
Shale, light to medium gray with some brown stain...	100.0	104.0
Shale, medium to dark gray, slightly micaceous; contains black carbonaceous streaks.....	104.0	106.0
Shale, light greenish gray, slightly calcareous, slightly micaceous.....	106.0	109.6

Limestone, white; crystalline to granular, oolitic, shaly; contains osagian crinoids, glauconite, and pyrite.....	109.6	110.5
Shale, light greenish gray and mottled dark yellowish brown.....	110.5	111.1
Shale, light greenish gray, slightly sandy, slightly calcareous, slightly micaceous.....	111.1	112.7
Shale, light greenish gray with some dark yellow stain, sandy, slightly calcareous, slightly micaceous; contains less stain below 113.7 ft.....	112.7	114.8
Shale, light gray, sandy, slightly calcareous, slightly micaceous.....	114.8	140.0
Shale, light to medium gray, moderately calcareous..	140.0	142.8
Emporia Formation:		
Elmont - Reading Members:		
Limestone, medium to dark gray, shaly, slightly crystalline; contains crinoids, fossil fragments and pyrite.....	142.8	145.3
Shale, light greenish gray.....	145.3	146.0
Limestone, light and medium gray, shaly, slightly crystalline with black inclusions.....	146.0	148.0
Limestone, light greenish gray, shaly, slightly crystalline.....	148.0	149.5
Limestone, light gray with mottled light greenish gray and medium to dark gray, slightly crystalline; contains glauconite, crinoid fragments and pyrite.....	149.5	150.9
Limestone, light gray, slightly crystalline; contains crinoids and pyrite.....	150.9	153.0
Auburn Formation:		
Shale, light greenish gray and medium gray, moderately calcareous; contains a trace of carbonaceous material; contains crinoids below 156.9 ft.....	153.0	160.0

Test Hole #5-B-49  
(A10-7-25dd)  
Lancaster County

Location: SE corner sec. 25, T. 10 N., R. 7 E., approximately 95 feet north and 6 feet west of southeast corner.  
Ground elevation: 1,245.0 ft. (t). (Walton 7.5 min. quadrangle)  
Depth to water: 10.0 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Clay, silty, dark brown to black; slightly calcareous below 2.5 ft., medium buff gray below 4 ft....	2.0	7.0
Till, clayey, silty, pebbly, light brownish gray; contains weathered fragments; slightly pebbly below 14.5 ft., slightly darker color below 18 ft.	7.0	26.0
Till, clayey, silty, sandy to pebbly, slightly calcareous, brownish gray, very sandy from 26 to 30 ft., noncalcareous below 34.5 ft., yellow.....	26.0	41.0
Sand, medium grained, in part silty below 43 ft.....	41.0	48.5
Till, clayey, silty, pebbly, light grayish yellow; contains some ironstone; from 70 to 83.5 ft., medium gray; contains some yellowish brown below 83.5 ft.....	48.5	95.0
Silt, sandy, buff gray to yellowish brown; sand is very fine; contains some ironstone.....	95.0	100.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine grained; sand is medium grained below 105 ft.....	100.0	119.0
Shale, white and yellow, silty.....	119.0	120.0
Sandstone, medium grained; contains some varicolored red silty clay shale lenses.....	120.0	123.0
Shale, white, clayey, silty.....	123.0	124.5
Sandstone, medium grained; contains some shaly clay lenses.....	124.5	130.5
Sandstone, fine to medium grained; contains some silty shale lenses.....	130.5	138.5
Shale, light gray, clayey, silty; contains some fine grained sandstone.....	138.5	140.0
Sandstone, fine grained; contains some light gray clay lenses.....	140.0	146.0
Shale, light gray, clayey, silty.....	146.0	150.0
Sandstone, fine grained, moderately consolidated; contains some silty clay shale lenses from 150 to 155 ft; sand is fine to medium from 165 to 170 ft. and below 176 ft; sand is medium to coarse from 170 to 176 ft.....	150.0	181.0
Shale, reddish brown, clayey; contains some ironstone; contains some gray and yellow below 184.5 ft.....	181.0	186.5

Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Limestone, light gray.....	186.5	187.0
Shale, light gray, clayey, very calcareous; contains some interbedded thin limestone lenses.....	187.0	188.5
Limestone, light gray; contains some thin light gray shale lenses.....	188.5	190.6

Test Hole #1-A-57  
(A10-8-12ac)  
Lancaster County

Location: SW SW NE sec. 12, T. 10 N., R. 8 E., approximately 1,835 feet south and 2,094 feet west of the northeast corner.  
Ground elevation: 1,243.0 ft. (t). (Eagle 7.5 min. quadrangle)  
Depth to water: 33.3 ft. (5-31-57).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, moderately clayey, dark brownish gray...	0.0	0.5
Silt, very clayey, dark brownish gray; medium brownish gray below 1.5 ft.....	0.5	3.0
Silt, moderately clayey, light yellowish gray; slightly clayey below 4 ft., light gray from 8 to 10 ft.....	3.0	12.5
Silt, moderately clayey, light brown; medium brown below 13 ft.....	12.5	14.0
Silt, very clayey, medium to dark brown; contains a trace of very coarse sand and fine gravel below 15 ft.....	14.0	16.5
Silt, very clayey, light brown; contains a trace of sand and gravel.....	16.5	17.0
Silt, very clayey, light gray; contains some very fine to medium sand; contains a few limy nodules below 18.5 ft.....	17.0	20.0
Silt, very clayey, light gray; contains a trace of very fine to medium sand; contains a few limy nodules from 22 to 25 ft; contains a large dark iron manganese concretion at 28 ft.....	20.0	35.5
Clay, silty, medium brown; contains a trace of fine to medium sand to 45 ft; sand is very fine to fine below 45 ft., light brown from 40 to 48 ft., medium brownish gray from 50.5 to 53 ft.....	35.5	55.0
Clay, silty, moderately sandy, light gray; sand is fine to medium; yellowish brown and slightly pebbly below 55.5 ft.....	55.0	56.0
Sand, very silty; sand is fine to medium.....	56.0	57.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone; sand is fine to medium with a trace of coarse.....	57.5	66.7
Shale, light yellowish gray, clayey, slightly silty, mottled with red below 70 ft.....	66.7	73.0
Shale and clay, interbedded, mottled red, yellow, and light gray.....	73.0	76.5
Sandstone, moderately consolidated; sand is fine to coarse; contains a thin shale lens below 82.5 ft..	76.5	82.6
Sandstone, sand is medium to coarse with some very coarse.....	82.6	85.0

Sandstone, medium sand to fine gravel (about 25 percent gravel); contains some reworked shale below 88.4 ft.....	85.0	89.6
Shale and clay, interbedded, mottled yellow, red, and brown.....	89.6	95.2
Shale, light green, clayey.....	95.2	95.8
Shale, reddish brown, clayey, dark brown from 97.5 to 99 ft., medium brownish gray to medium olive gray from 99 to 99.6 ft.....	95.8	100.2
Shale, mottled light gray and light brown, silty, and clay, interbedded; contains some nodular siltstone and claystone from 100.2 to 100.5 ft., reddish brown from 106 to 106.5 ft., light olive gray from 107.5 to 110 ft., light gray from 110 to 113 ft., medium gray and contains a trace of pyrite below 113 ft; contains a trace of carbonaceous material from 126 to 130 ft.....	100.2	140.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
Limestone, medium gray.....	140.0	141.6
Shale, medium gray, very calcareous, interbedded with thin shaly limestone layers.....	141.6	143.3
Limestone, light gray.....	143.3	143.8
Shale, light gray, clayey, slightly calcareous, medium gray below 144 ft.....	143.8	146.5
Coal, black.....	146.5	147.0
Shale, light olive gray, light greenish gray from 148 to 150 ft., bluish gray, moderately calcareous and contains a trace of pyrite below 150 ft..	147.0	151.4
Limestone, medium gray, argillaceous.....	151.4	153.5
Shale, light greenish gray, slightly clayey, moderately calcareous; contains a trace of pyrite below 155 ft.....	153.5	156.0
Shale, brownish gray and reddish brown, moderately calcareous, mottled brown and light gray from 161.9 to 162.7 ft; contains light gray shale layer and nodular limestone from 165.6 to 166 ft.....	156.0	168.5
Shale, medium gray, clayey; contains a trace of pyrite; contains some thin coal layers from 174 to 174.2 ft., light gray below 174.3 ft; contains some thin interbedded siltstone layers from 178.5 to 185 ft.....	168.5	190.0
Shale, medium to dark gray, clayey; contains a trace of pyrite; contains a thin limy layer at 197 ft...	190.0	201.5

Test Hole #2-A-48  
(A11-5-3aa)  
Lancaster County

Location: NE corner sec. 3, T. 11 N., R. 5 E., approximately 9 feet south and 86 feet west of the northeast corner.  
Ground elevation: 1,235.0 ft. (t). (Raymond 7.5 min. quadrangle)  
Depth to water: Artesian flow (5-21-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, dark brownish gray.....	0.0	2.0
Silt, buff brown.....	2.0	4.2
Soil, slightly clayey, dark brownish gray.....	4.2	5.0
Silt, clayey, light brownish gray.....	5.0	8.5
Silt, moderately clayey, light brownish buff; below 10 ft., slightly calcareous; contains a few limy nodules.....	8.5	16.5
Silt, clayey, light brownish gray.....	16.5	20.0
Silt, slightly clayey, dark gray with a slight brownish tint, medium gray below 25 ft.....	20.0	33.0
Silt, slightly clayey, medium gray; contains some interbedded sandy silt; sand is very fine.....	33.0	40.0
Sand and gravel, medium sand to medium gravel with a trace of coarse gravel; contains more coarse grave below 50 ft.....	40.0	52.5
Silt, moderately clayey, light gray; below 55 ft., slightly more clayey; contains a few limy nodules	52.5	62.0
Silt, very clayey, brownish gray, slightly clayey, sandy; sand is very fine below 80 ft., moderately sandy; sand is very fine to fine with some medium below 90 ft.....	62.0	100.0
Siltstone, light gray; contains many limy fragments.	100.0	100.5
Sand and gravel, coarse sand to medium gravel with a little medium sand; contains many ironstone grains.....	100.5	110.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, mottled red, light gray, and yellow, clayey; contains interbedded siltstone and sandy silt.....	110.0	120.0



Test Hole #5-B-48  
(A11-5-11cc)  
Lancaster County

Location: SW SW SW sec. 11, T. 11 N., R. 5 E., approximately 11 feet north and 192 feet east of the southwest corner.  
Ground elevation: 1,365.0 ft. (t). (Raymond 7.5 min. quadrangle)  
Depth to water: 103.2 ft. (5-19-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, slightly clayey, dark brownish gray; slightly more clayey and dark brown with grayish tint below 0.5 ft.....	0.0	1.5
Silt, moderately clayey, buff brown.....	1.5	13.0
Silt, slightly clayey, light buff gray.....	13.0	14.7
Silt, in part slightly clayey, reddish brown; contains a few fine to coarse sand grains.....	14.7	20.0
Sand and gravel, silty; coarse sand to medium gravel.....	20.0	21.0
Till, clay, sandy to gravelly, moderately calcareous, buff gray to yellowish brown; contains limy pebbles.....	21.0	48.5
Clay, silty, sandy, yellowish brown; contains some carbonaceous material to 51 ft., light gray below 51 ft.....	48.5	53.0
Clay, silty, moderately calcareous, buff brown; slightly calcareous below 55 ft., slightly calcareous from 55 to 60 ft., medium brown below 60 ft..	53.0	61.0
Silt, moderately clayey, moderately calcareous, brownish buff with gray tint; contains a few limy nodules to 65 ft.; slightly clayey, light brownish tan below 65 ft.....	61.0	67.0
Silt, slightly clayey, moderately calcareous to 70 ft., light gray below 80 ft; contains a few limy nodules from 75 to 80 ft; in part slightly sandy below 85 ft.....	67.0	90.0
Silt, slightly clayey, light brown; contains some limy nodules below 95 ft., in part slightly clayey below 85 ft.....	90.0	100.0
Silt, light gray; contains a trace of carbonaceous material; contains some thin interbedded siltstone layers from 105 to 115 ft.....	100.0	141.0
Silt, slightly clayey, slightly calcareous, light gray.....	141.0	148.0
Sand, very fine grained; contains a light gray silt layer from 173 to 174 ft.....	148.0	176.0
Silt, sandy, medium gray; sand is very fine; contains some thin siltstone layers.....	176.0	185.0
Siltstone, slightly sandy, medium to dark gray; sand is very fine.....	185.0	207.0

Clay, silty, carbonaceous, medium to dark brownish gray and black.....	207.0	210.0
Silt, clayey, medium gray.....	210.0	215.0
Silt, moderately sandy, light gray; sand is fine to medium with a little coarse; contains some small limy nodular fragments below 220 ft.....	215.0	225.0
Silt, very clayey, moderately calcareous, light gray; contains a thin limy layer below 235 ft.....	225.0	238.0
Sand and gravel, medium sand to medium gravel; contains reworked material.....	238.0	257.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, white with some mottled reddish purple and yellow, clayey.....	257.0	270.0

Test Hole #1-B-42  
(A11-5-25dd)  
Lancaster County

Location: SE SE SE sec. 25, T. 11 N., R. 5 E., approximately 575 feet north and 50 feet west of the southeast corner.  
Ground elevation: 1,188.0 ft. (a). (Raymond 7.5 min. quadrangle)  
Depth to water: No water level taken.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
No sample.....	0.0	5.0
Silt, moderately clayey, very dark gray.....	5.0	15.0
Clay, silty, light brownish gray; slightly mica- ceous, dark brownish gray below 17 ft.....	15.0	22.0
Clay, silty, very dark gray, slightly micaceous, carbonaceous.....	22.0	29.0
Silt, moderately clayey, slightly sandy, slightly calcareous, medium gray; sand is very fine.....	29.0	43.0
Silt, moderately clayey, moderately calcareous, light gray with a slight greenish tint.....	43.0	53.0
Silt, clayey, slightly sandy, light gray to reddish brown; sand is very fine; contains some iron cemented sand.....	53.0	55.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, red with mottled gray and yellow, clayey, silty, light red below 57 ft.....	55.0	62.0
Shale, light greenish gray, clayey, silty, slightly micaceous.....	62.0	69.0
Sandstone, iron stained; sand is very fine to medium with some coarser grains.....	69.0	80.0
Sandstone, iron stained; sand is very fine to medium.....	80.0	95.0
Shale, light greenish gray, clayey, silty, slightly sandy; sand is very fine.....	95.0	97.0
Sandstone, iron stained; sand is very fine to medium; contains some ironstone fragments; con- tains some coarse sand below 105 ft.....	97.0	119.0

Test Hole #1-B-45  
(A11-5-26cc)  
Lancaster County

Location: SW SW SW sec. 26, T. 11 N., R. 5 E., approximately 212 feet north and 8 feet east of the southwest corner.  
Ground elevation: 1,237.0 ft. (a). (Raymond 7.5 min. quadrangle)  
Depth to water: 8.3 ft. (6-13-45).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, sandy, very dark gray; sand is very fine.....	0.0	2.0
Silt, moderately clayey, sandy, black; sand is very fine.....	2.0	5.0
Silt, moderately clayey, gray; very clayey and contains a trace of iron stain below 10 ft.....	5.0	17.5
Clay, silty, gray; light gray from 20 to 24 ft.....	17.5	30.0
Silt, moderately clayey, moderately sandy, light olive gray; sand is very fine.....	30.0	41.5
Silt, moderately clayey, moderately sandy, slightly calcareous, olive gray; sand is very fine; contains a trace of carbonaceous material.....	41.5	45.0
Silt, moderately clayey, moderately calcareous, dark gray; contains fine gravel from 47.5 to 48 ft.....	45.0	50.0
Silt, slightly clayey, sandy, light gray with greenish tint, micaceous; sand is very fine; contains some dark silicates; slightly calcareous from 55 to 60 ft., very calcareous below 60 ft....	50.0	65.0
Silt, slightly clayey, moderately sandy, moderately calcareous, light gray; sand is very fine; contains some dark silicates; slightly less sandy and contains a greenish tint below 70 ft.....	65.0	75.0
Silt, slightly clayey, slightly sandy, very calcareous, light gray with greenish tint; sand is fine; contains a few dark silicates; slightly less calcareous below 80 ft.....	75.0	83.0
Silt, slightly clayey, moderately calcareous, gray, slightly micaceous; contains a trace of carbonaceous material from 110 to 115 ft., slightly sandy, slightly calcareous; sand is very fine below 115 ft.....	83.0	120.0
Clay, silty, slightly calcareous, gray.....	120.0	124.0
Silt, moderately clayey, dark gray to black.....	124.0	125.0
Clay, silty, gray; slightly calcareous below 135 ft.	125.0	135.0
Silt, moderately clayey, slightly sandy, slightly calcareous, gray; sand is very fine.....	135.0	140.0
Silt, moderately clayey, slightly calcareous, light gray.....	140.0	143.0

Sand, moderately silty; sand is very fine to fine; contains some iron stain.....	143.0	145.0
Silt, moderately clayey, slightly calcareous, light gray.....	145.0	150.0
Silt, slightly clayey, slightly sandy, slightly calcareous, light gray with greenish tint; sand is very fine.....	150.0	154.5
Sand, fine to coarse; contains a little fine gravel principally ironstone and shale fragments.....	154.5	160.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, very fine to fine.....	160.0	165.0
Shale, medium gray, clayey, micaceous; contains some interbedded sandstone; sand is very fine.....	165.0	170.0
Sandstone, sand is very fine to medium.....	170.0	176.0
Shale, medium gray, silty, clayey, micaceous; con- tains some interbedded sandstone; sand is very fine.....	176.0	179.0
Shale, medium gray, silty, clayey, micaceous.....	179.0	180.0

Test Hole #1-A-44  
 (A11-5-30cc)  
 Lancaster County

Location: SW SW SW sec. 30, T. 11 N., R. 5 E., approximately 18  
 feet north and 41 feet east of the southwest corner.  
 Ground elevation: 1,300.0 ft. (t). (Garland 7.5 min. quadrangle)  
 Depth to water: 10.8 ft. (6-14-44).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil.....	0.0	2.0
Silt, sandy, yellowish gray.....	2.0	5.0
Sand and gravel, silty; fine sand to medium gravel..	5.0	14.0
Sand, silty; sand is fine grained.....	14.0	26.0
Sand and gravel, fine sand to fine gravel; coarser grained below 39 ft.....	26.0	45.0

Test Hole #51-A-51  
(A11-6-6db)  
Lancaster County

Location: NW corner SE sec. 6, T. 11 N., R. 6 E., approximately  
2,530 feet north and 2,600 feet west of the southeast corner.  
Ground elevation: 1,205.0 ft. (t). (Raymond 7.5 min. quadrangle)  
Depth to water: 14.6 ft. (11-28-51).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Silt, darkish brown; granular textured.....	0.0	1.5
Silt, slightly clayey, dark brown, slightly lighter in color below 2 ft.....	1.5	5.0
Silt, moderately clayey; granular textured, medium grayish brown; slightly lighter in color below 8.5 ft.....	5.0	9.5
Clay, silty, medium brownish gray, medium yellowish brown below 10.5 ft., slightly lighter in color from 15 to 17 ft., medium grayish brown from 17 to 20 ft., slightly darker color below 20 ft; con- tains some iron stain below 22.5 ft.....	9.5	25.0
Sand, fine to medium; contains a silt lens at 26.5, 27.2 and 28.5 ft.....	25.0	30.0
Sand, fine to coarse.....	30.0	35.0
Sand and gravel, medium sand to medium gravel.....	35.0	39.0
Silt, slightly clayey, brown to black, dark gray from 40 to 45 ft., slightly lighter color below 45 ft.....	39.0	50.0
Silt, clayey, sandy, medium gray with bluish green tint; slightly calcareous, slightly lighter color below 55 ft.....	50.0	60.0

Test Hole #63-A-51  
 (A11-6-20dc)  
 Lancaster County

Location: SE corner SW SE sec. 20, T. 11 N., R. 6 E., approximately  
 50 feet north and 1,350 feet west of the southeast corner.  
 Ground elevation: 1,185.0 ft. (t). (Raymond 7.5 min. quadrangle)  
 Depth to water: No water level taken.

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, dark brown; granular textured.....	0.0	2.0
Silt, slightly clayey, dark brown; granular textured.....	2.0	3.0
Silt, moderately clayey, medium grayish brown; slightly more clayey, slightly darker color below 10 ft.....	3.0	14.5
Silt, slightly sandy, light gray.....	14.5	15.0
Sand, fine to coarse; sand is very fine to medium below 20 ft.....	15.0	25.0
Sand, medium to very coarse with some fine gravel...	25.0	30.0



Test Hole #52-A-51  
(A11-6-31ac)  
Lancaster County

Location: SW corner NE sec. 31, T. 11 N., R. 6 E., approximately  
100 feet north and 30 feet east of the center of section.  
Ground elevation: 1,185.0 ft. (t). (Raymond 7.5 min. quadrangle)  
Depth to water: 16.01 ft. (11-28-51).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, dark brown.....	0.0	4.0
Silt, slightly clayey, dark brown.....	4.0	6.5
Silt, moderately clayey, medium grayish brown.....	6.5	7.5
Silt, moderately clayey, light yellowish brown.....	7.5	19.0
Silt, slightly clayey, light brownish gray; gran- ular textured.....	19.0	21.0
Sand and gravel, fine sand to fine gravel.....	21.0	29.0
Silt, clayey to slightly sandy, medium brown; sand is very fine.....	29.0	31.0

Test Hole #34-B-46  
(A11-6-35cc)  
Lancaster County

Location: NE SW SW sec. 35, T. 11 N., R. 6 E., approximately 1,310 feet north and 850 feet east of the southwest corner.  
Ground elevation: 1,305.0 ft. (t). (Davey 7.5 min. quadrangle)  
Depth to water: 39.8 ft. (7-13-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray.....	0.0	2.0
Silt, clayey, light brownish buff.....	2.0	13.0
Silt, clayey, sandy, medium to dark brown, light brownish yellow below 15 ft.....	13.0	17.0
Till, clayey, sandy to gravelly, gray and brown, contains some yellowish brown below 25 ft.....	17.0	38.0
Sand, silty; sand is fine to coarse with some gravel	38.0	48.5
Clay, silty, sandy, light gray and yellowish brown; contains some pebbles.....	48.5	65.0
Clay, silty, sandy, medium to dark gray; contains a few pebbles; contains some gravel below 80 ft.....	65.0	97.0
Sand and gravel, slightly silty; fine sand to fine gravel with some medium to coarse gravel.....	97.0	100.0
Clay, silty, sandy, medium to darkish gray; slightly lighter color below 125 ft.....	100.0	146.0
Silt, sandy, medium gray.....	146.0	155.0
Clay, silty, medium gray.....	155.0	160.0
Silt, slightly clayey, medium to dark gray.....	160.0	165.0
Sand, silty; sand is fine to medium with some coarse	165.0	184.0
Silt, slightly clayey, medium gray.....	184.0	187.0
Sand, silty; sand is fine grained.....	187.0	195.0
Sand, gravelly; fine sand to fine gravel.....	195.0	214.0
Silt, slightly clayey, in part sandy, medium gray...	214.0	218.0
Sand, fine to coarse with some fine gravel.....	218.0	220.0
Silt, sandy, light gray; sand is fine grained.....	220.0	225.0
Silt, clayey, light gray.....	225.0	243.0
Sand, fine to medium with some coarse; contains some reworked material.....	243.0	250.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, moderately consolidated; sand is fine to medium; contains a light brown clay layer from 264.5 to 265 ft.; sand is medium to coarse below 265 ft.....	250.5	266.0
Shale, light gray, clayey; contains some interbedded fine sandstone below 266.4 ft.....	266.0	266.9
Shale, light brown to yellow, sandy, to shaly sandstone; sand is fine grained.....	266.9	270.0
Shale, light gray, silty.....	270.0	273.4

Shale, yellowish brown and gray, silty, sandy; sand is fine grained.....	273.4	275.0
Sandstone, sand is fine to coarse; sand is fine to very coarse from 280 to 290 ft; contains a thin ironstone layer at 285.5 ft.....	275.0	300.0
Sandstone, sand is fine to medium with some coarse; sand is fine to very coarse below 305 ft.....	300.0	310.0
Sandstone, sand is fine to coarse with some very coarse.....	310.0	316.5
Shale, light gray, silty.....	316.5	318.0
Sandstone, sand is fine to medium; moderately consolidated from 336.5 to 336.9 ft; contains some coarse sand below 350 ft.....	318.0	360.0
Sandstone, sand is fine to very coarse.....	360.0	372.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Limestone.....	372.0	373.0

Test Hole #25-B-46  
(A11-7-29ac)  
Lancaster County

Location: SE SW NE sec. 29, T. 11 N., R. 7 E., approximately 2,629 feet south and 1,500 feet west of the northeast corner.  
Ground elevation: 1,188.0 ft. (t). (Davey 7.5 min. quadrangle)  
Depth to water: 37.1 ft. (6-27-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	0.5
Soil, clay, silty, black.....	0.5	1.5
Clay, silty, medium brown.....	1.5	2.5
Silt, very clayey, light brown.....	2.5	5.0
Silt, moderately clayey, light yellowish gray with brownish tint; slightly less clayey from 10 to 15 ft; contains no brownish tint; contains a trace of limy material, slightly more clayey; contains a trace of sand below 15 ft.....	5.0	18.5
Silt, clayey, slightly sandy, medium brown; sand is fine to medium; slightly more sandy below 20 ft...	18.5	22.0
Clay, silty to sandy, yellowish gray and light brown	22.0	25.0
Till, clay, sandy to gravelly.....	25.0	42.0
Clay, silty, sandy, dark gray.....	42.0	50.0
Clay, silty; contains wood fragments, peaty.....	50.0	51.0
Clay, moderately calcareous, medium to greenish gray	51.0	55.0
Silt, clayey, moderately calcareous, light gray with bluish green tint.....	55.0	57.0
Sand and gravel, composed of limestone fragments....	57.0	65.5
Silt, clayey, slightly calcareous, medium gray.....	65.5	140.0
Silt, slightly clayey, dark gray.....	140.0	149.0
Sand, slightly silty; sand is fine to coarse.....	149.0	150.0
Sand and gravel, fine sand to fine gravel with some medium gravel; contains some reworked sandstone; contains some coarse gravel below 155 ft.....	150.0	161.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine to coarse grained.....	161.0	176.0
Clay, white, silty to sandy.....	176.0	177.0
Shale, red with a little yellow and white, silty, sandy.....	177.0	180.0
Shale, medium brownish tan, clayey to silty.....	180.0	185.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Shale, medium to dark gray with some black, clayey, silty.....	185.0	189.0
Limestone, light gray with brownish tint.....	189.0	190.2
Shale, light gray to white, clayey.....	190.2	190.5
Limestone, light gray with brownish tint.....	190.5	190.8

Test Hole #53-A-51  
 (A11-7-30db)  
 Lancaster County

Location: NW corner SE sec. 30, T. 11 N., R. 7 E., approximately  
 40 feet south and 100 feet east of the center of section.  
 Ground elevation: 1,155.0 ft. (t). (Davey 7.5 min. quadrangle)  
 Depth to water: 17.9 ft. (11-28-51).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, dark brown; granular textured.....	0.0	1.5
Silt, slightly clayey, dark brown, moderately clayey and medium brown below 2.5 ft.....	1.5	9.0
Silt, slightly clayey, light yellowish brown; gran- ular textured below 10 ft.....	9.0	20.5
Sand, fine to medium with some coarse to very coarse	20.5	23.0

Test Hole #24-B-46  
(A11-7-32aa)  
Lancaster County

Location: NE corner sec. 32, T. 11 N., R. 7 E., approximately 3 feet south and 21 feet west of the northeast corner.  
Ground elevation: 1,135.0 ft. (a). (Davey 7.5 min. quadrangle)  
Depth to water: 16.3 ft. (6-25-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	1.5
Soil, silt, clayey, black.....	1.5	3.0
Clay, darkish gray to brown, medium gray to brown below 7 ft.....	3.0	9.5
Clay, silty, dark brownish gray.....	9.5	10.0
Silt, clayey, light brownish gray.....	10.0	26.0
Sand, silty; sand is fine to coarse.....	26.0	29.0
Clay, silty, dark gray, in part carbonaceous.....	29.0	35.0
Silt, sandy, to silty sand, dark gray; sand is very fine to fine.....	35.0	37.5
Sand, fine to coarse with some fine gravel.....	37.5	40.0
Sand and gravel, medium sand to coarse gravel with some pebbles.....	40.0	44.0
Silt, slightly calcareous, medium gray.....	44.0	97.0
Sand and gravel, fine sand to fine gravel; contains limonitic fragments.....	97.0	98.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Limestone, light gray.....	98.0	98.8

Test Hole #1-A-73  
(11-7-32cb)  
Lancaster County

Location: SE NE SW sec. 32, T. 11 N., R. 7 E., approximately 1,785 feet north and 2,828 feet west of the southeast corner.  
Ground elevation: 1,333.0 ft. (t). (Davey 7.5 min. quadrangle)  
Depth to water: 13.34 ft. (3-28-73).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, very clayey, black.....	0.0	1.4
Soil, moderately clayey, dark yellowish brown; slightly sandy below 1.8 ft.....	1.4	5.0
Silt, slightly clayey, dark yellowish brown; sand is very fine to coarse; trace of iron stain below 12.4 ft.....	5.0	16.0
Sand, slightly silty; sand is very fine to coarse...	16.0	18.5
Silt, very clayey, slightly sandy, grayish green; sandy below 21.3 ft.....	18.5	21.8
Silt, very clayey, slightly sandy, dark greenish gray; dark gray below 25.0 ft.....	21.8	34.0
Sand, moderately silty; sand is very fine to coarse, trace of fine gravel.....	34.0	37.8
Sand, gravelly; fine sand to fine gravel, slightly silty below 40.0 ft.....	37.8	52.0
Clay, silty, yellowish green to gray; gray below 55 ft.....	52.0	68.0
Clay, silty, black to gray.....	68.0	70.0
Silt, very sandy, gray; sand is very fine.....	70.0	90.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is very fine to medium, trace of coarse.....	90.0	95.0
Sandstone, sand is fine to coarse, much medium; some fine gravel from 100.0 to 105.0 ft; much coarse sand below 105 ft.....	95.0	110.0

Test Hole #2-A-73  
(11-7-32da)  
Lancaster County

Location: NE NE SE sec. 32, T. 11 N., R. 7 E., approximately 2,156.5 feet north and 173 feet west of the southeast corner.  
Ground elevation: 1,134.0 ft. (t). (Davey 7.5 min. quadrangle)  
Depth to water: unknown; test hole caved at 3 ft. (3-28-73).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, moderately clayey, black, dark brown below 1.5 ft.....	0.0	5.0
Silt, slightly clayey, dark grayish brown, some limy fragments, slight iron stain.....	5.0	10.0
Silt, slightly clayey, sandy, gray; sand is very fine; dark grayish black from 15 to 20.5 ft., dark gray below 20.5 ft.....	10.0	25.0
Sand, silty; sand is very fine with a trace of fine to coarse.....	25.0	29.5
Sand and gravel, fine sand to fine gravel; much coarse to very coarse sand.....	29.5	40.0
Sand, moderately silty; sand is very fine to coarse with a trace of fine gravel, interbedded silt lenses from 43.8 to 45.5 ft.....	40.0	60.0
Sand and gravel, very fine sand to fine gravel, much coarse to very coarse sand.....	60.0	70.0
Sand, slightly silty; sand is very fine to coarse, much medium to coarse, trace of fine gravel.....	70.0	73.0
Clay, slightly sandy, gray; sand is very fine to medium.....	73.0	75.0
Sand, very fine to coarse, much medium to coarse....	75.0	93.0
Sand, fine to very coarse; contains limestone, sandstone, ironstone, and fossil fragments.....	93.0	97.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, very fine to very coarse, much medium to coarse; trace of fine gravel below 100.5 ft.....	97.0	107.0
Sand and gravel, principally shale fragments.....	107.0	110.0



Test Hole #3-A-73  
(11-7-32dd)  
Lancaster County

Location: SE SE SE sec. 32, T. 11 N., R. 7 E., approximately 118 feet north and 24.1 feet west of the southeast corner.  
Ground elevation: 1,136.0 ft. (t). (Lincoln 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, moderately clayey, black; brownish black below 1.5 ft.....	0.0	5.5
Clay, moderately silty, slightly sandy, yellowish brown; sand is very fine.....	5.5	7.8
Sand, silty; sand is very fine to coarse.....	7.8	25.0
Sand, very fine to very coarse, trace of fine gravel	25.0	30.0
Sand and gravel, very fine sand to fine gravel.....	30.0	39.0
Clay, silty, dark gray.....	39.0	59.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, moderately silty; sand is very fine to very coarse; trace of fine gravel from 55.5 to 60 ft. and below 75 ft., in places iron cemented.....	59.0	110.0

Test Hole #5-A-73  
(11-7-32aa)  
Lancaster County

Location: NE NE NE sec. 32, T. 11 N., R. 7 E., approximately 423.5 feet south and 143 feet west of the northeast corner.  
Ground elevation: 1,142.0 ft. (t). (Davey 7.5 min. quadrangle)  
Depth to water: unknown.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, moderately clayey, black, brownish black below 1.5 ft.....	0.0	8.0
Silt, slightly clayey, sandy, dark grayish brown; sand is very fine, some iron stain.....	8.0	22.0
Sand, very fine to medium; slightly silty below 25 ft.....	22.0	29.0
Clay, moderately silty, dark grayish black, sandy below 30 ft; sand is very fine with some medium below 36 ft.....	29.0	36.0
Sand and gravel, very fine sand to fine gravel; fine sand to medium gravel below 40 ft.....	36.0	44.0
Silt, very clayey, dark gray, medium gray below 50 ft.....	44.0	88.0
Silt, moderately clayey, very sandy; sand is very fine to medium.....	88.0	95.0
Sand, very fine to very coarse.....	95.0	100.0
Sand and gravel, fine sand to fine gravel; many ironstone fragments.....	100.0	104.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, very fine to very coarse, some silt seams	104.0	110.0
Sandstone, very fine to very coarse with a trace of fine gravel, some ironstone fragments; slightly finer below 115 ft.....	110.0	120.0
Sandstone, very fine to medium, trace of coarse to very coarse.....	120.0	130.0

Test Hole #23-B-46  
(A11-7-33dc)  
Lancaster County

Location: SW SW SE sec. 33, T. 11 N., R. 7 E., approximately 21 feet north and 1,760 feet west of the southeast corner.  
Ground elevation: 1,145.0 ft. (a). (Lincoln 7.5 min. quadrangle)  
Depth to water: 23.5 ft. (6-18-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, black.....	0.0	2.0
Clay, silty, dark gray.....	2.0	5.0
Silt, clayey, light brownish buff.....	5.0	18.0
Sand, fine to medium with some coarse; sand is fine to coarse below 21 ft.....	18.0	28.0
Silt, slightly clayey, in part sandy, greenish gray to dark gray.....	28.0	29.5
Sand, fine to medium with some coarse.....	29.5	33.5
Sand, silty to clayey; sand is medium to coarse.....	33.5	35.0
Silt, clayey, gray to yellowish gray; contains a few pebbles from 35 to 38.5 ft.....	35.0	40.0
Silt, slightly clayey, grayish green.....	40.0	45.0
Sand and gravel, fine sand to coarse gravel; contains some interbedded gray clay layers with a few pebbles from 50 to 55 ft; contains less gravel below 55 ft.....	45.0	60.0
Sand and gravel, fine sand to medium gravel with some coarse gravel; contains some interbedded gray sandy clay layers; contains medium sand to coarse gravel with a few pebbles below 75 ft.....	60.0	81.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, sand is fine to medium with some coarse; contains ironstone layer from 89 to 90.3 ft.....	81.5	100.0

Test Hole #54-A-51  
 A11-7-35cb)  
 Lancaster County

Location: NE SW SW sec. 35, T. 11 N., R. 7 E., approximately 2,200 feet north and 1,300 feet east of the southwest corner.  
 Ground elevation: 1,135.0 ft. (t). (Waverly 7.5 min. quadrangle)  
 Depth to water: 12.4 ft. (11-28-51).

	<u>Depth, in feet</u>	
	<u>From</u>	<u>To</u>
Quaternary System, undifferentiated:		
Soil, silt, dark brown.....	0.0	1.5
Silt, slightly clayey, dark brown; granular textured below 2.5 ft., slightly lighter color below 5 ft..	1.5	7.5
Silt, moderately clayey, medium gray with brown tint.....	7.5	10.0
Silt, moderately clayey, light brownish gray; contains some iron stain, slightly clayey below 15 ft.....	10.0	19.0
Silt, slightly clayey, sandy, light gray with bluish tint; sand is very fine.....	19.0	20.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, very fine to medium.....	20.0	22.0

Test Hole #31-B-46  
(A11-8-5da)  
Lancaster County

Location: SE NE SE sec. 5, T. 11 N., R. 8 E., approximately 1,600 feet north and 9 feet west of the southeast corner.  
Ground elevation: 1,113.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 17.6 ft. (7-1-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, dark brown to black.....	0.0	3.0
Clay, silty, dark gray; medium gray to brown below 6 ft.....	3.0	8.0
Silt, clayey, light brownish gray; contains some iron stain; contains some rootlets and limonitic pellets below 15 ft.....	8.0	21.0
Sand, fine to coarse; contains some fine gravel from 26 to 32 ft.....	21.0	34.0
Clay, silty, light green.....	34.0	35.0
Sand, fine to coarse with some fine gravel; contains slightly less gravel below 40 ft.....	35.0	44.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud Member:		
Shale, yellow, clayey.....	44.0	46.0
Shale, medium to dark gray.....	46.0	48.0
Howard Formation:		
Limestone, dark gray, shaly.....	48.0	48.8
Shale, dark gray, clayey.....	48.8	50.1
Limestone, medium to dark gray, shaly; contains some shale below 50.4 ft.....	50.1	52.0
Limestone, medium gray; contains some fusulinid fragments from 56.4 to 57.2 ft.....	52.0	57.8
Severy Formation:		
Shale, black.....	57.8	60.0
Shale, medium gray, clayey.....	60.0	61.0
Shale, black, fissile.....	61.0	62.3
Shale, dark gray, clayey.....	62.3	63.4
Limestone, medium gray, shaly.....	63.4	63.7
Shale, light gray.....	63.7	64.2
Shale, medium to dark gray, clayey.....	64.2	65.6
Shawnee Group:		
Topeka Formation:		
Coal Creek Member:		
Limestone, dark gray, shaly and fossiliferous below 66.9 ft.....	65.6	67.2
Limestone, light gray.....	67.2	69.1
Du Bois Member:		
Shale, dark gray to black.....	69.1	70.7
Holt Member:		
Limestone, light gray.....	70.7	71.0

Test Hole #32-B-46  
(A11-8-5bb)  
Lancaster County

Location: NE NW NW sec. 5, T. 11 N., R. 8 E., approximately 11 feet south and 700 feet east of the northwest corner.  
Ground elevation: 1,144.0 ft. (t). (Waverly 7.5 min. quadrangle)  
Depth to water: 22.1 ft. (7-2-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Fill.....	0.0	1.0
Soil, clay, silty, dark brown.....	1.0	2.0
Clay, silty, light brown.....	2.0	3.0
Silt, clayey, light brownish buff.....	3.0	16.0
Clay, silty, medium reddish brown; slightly sandy, light reddish brown; sand is fine below 20 ft.....	16.0	25.0
Clay, silty, sandy, light brownish gray to pink; sand is fine.....	25.0	28.0
Silt, clayey, sandy, light gray to brown; sand is fine; contains some interbedded sand lenses below 30 ft.....	28.0	35.0
Sand, very silty; sand is fine to coarse.....	35.0	38.0
Clay, silty, light gray.....	38.0	50.0
Silt, slightly clayey, sandy, light gray.....	50.0	56.5
Sand, silty; sand is fine to medium.....	56.5	59.5
Silt, clayey, sandy, light gray; contains interbedded thin sand lenses, sand is fine to medium...	59.5	61.0
Sand, silty; sand is fine to coarse.....	61.0	68.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud - Cedarvale Members:		
Shale, red with a little light gray, clayey; contains a limy layer at 69 ft.....	68.0	72.1
Limestone, light gray, shaly.....	72.1	72.2
Shale, red with some greenish gray, clayey.....	72.2	76.0
Shale, medium to dark gray, clayey.....	76.0	82.2
Limestone, dark gray, shaly.....	82.2	83.1
Shale, medium to dark gray, clayey, slightly micaceous from 88 to 90 ft.....	83.1	101.1
Limestone, dark gray, shaly.....	101.1	101.4
Shale, medium to dark gray, clayey.....	101.4	118.7
Howard Formation:		
Limestone, medium to dark gray, shaly.....	118.7	119.1
Shale, dark gray, clayey.....	119.1	120.4
Limestone, medium to dark gray, shaly.....	120.4	120.8
Shale and shaly limestone, dark gray.....	120.8	125.0
Limestone, light gray.....	125.0	127.3
Shale, light gray, limy and limestone.....	127.3	129.1
Limestone, medium gray.....	129.1	129.3

Severy Formation:		
Shale, light gray, limy.....	129.3	130.2
Shale, black.....	130.2	131.0
Shale, medium gray, clayey.....	131.0	132.0
Shale, black.....	132.0	133.2
Shale, medium gray to brown; very calcareous below 134.7 ft.....	133.2	135.1
Shale, medium to dark gray, clayey.....	135.1	137.0
Shale, medium gray to brown, very calcareous.....	137.0	137.7
Shawnee Group:		
Topeka Formation:		
Coal Creek Member:		
Limestone, light gray.....	137.7	138.0

Test Hole #29-B-46  
(A11-8-9da)  
Lancaster County

Location: SE NE SE sec. 9, T. 11 N., R. 8 E., approximately 1,650 feet north and 8 feet west of the southeast corner.  
Ground elevation: 1,127.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 26.8 ft. (6-29-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, dark brown.....	0.0	1.0
Clay, silty, medium brownish gray.....	1.0	2.0
Silt, clayey, light brownish buff.....	2.0	10.5
Sand, fine to coarse; sand is fine to medium with some coarse below 20 ft.....	10.5	30.0
Sand, fine to medium.....	30.0	38.0
Silt, slightly clayey, sandy, light brownish gray; sand is fine.....	38.0	38.5
Sand, fine to coarse with some thin gray, silty clay layers.....	38.5	54.5
Sand, fine grained; contains some thin gray, silty clay layers.....	54.5	60.5
Clay, silty, medium gray.....	60.5	67.0
Sand, fine to coarse with some fine gravel; contains some wood fragments.....	67.0	70.0
Sand and gravel, fine sand to fine gravel with some medium to coarse gravel; contains fine sand to medium gravel with some coarse gravel and a few pebbles below 80 ft.....	70.0	94.0
Sand and gravel, fine sand to fine gravel with some medium gravel.....	94.0	97.0
Pennsylvanian System - Virgil Series - Shawnee Group:		
Deer Creek Formation:		
Ervine Creek Member:		
Limestone, light gray.....	97.0	101.9
Shale, light gray, limy.....	101.9	102.3
Limestone, light gray.....	102.3	104.4
Shale, light gray, calcareous.....	104.4	105.5
Limestone, light gray.....	105.5	106.4
Shale, light gray.....	106.4	106.6
Limestone, medium gray.....	106.6	106.9
Larsh Member:		
Shale, black, fissile.....	106.9	108.0
Rock Bluff Member:		
Limestone, light gray.....	108.0	108.5



Test Hole #30-B-46  
(A11-8-9ba)  
Lancaster County

Location: SE NE NW sec. 9, T. 11 N., R. 8 E., approximately 1,050 feet south and 2,629 feet east of the northwest corner.  
Ground elevation: 1,109 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 13.3 ft. (7-1-46).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil, silty, clayey, dark brown to black; dark brownish gray below 4 ft.....	0.0	5.0
Silt, clayey, light gray to brown; contains limonitic rootlets and fragments below 10 ft.....	5.0	14.5
Silt, clayey, dark gray; contains some interbedded sand layers.....	14.5	21.0
Silt, clayey, dark gray.....	21.0	26.0
Sand, silty; sand is fine to medium with some coarse Sand and gravel, fine sand to medium gravel; contains some medium to coarse gravel below 35 ft....	26.0	27.5
Silt, clayey, dark greenish gray; contains some carbonaceous material.....	27.5	36.0
Sand, fine to coarse.....	36.0	41.0
Clay, silty, medium gray.....	41.0	44.0
Sand, fine to coarse.....	44.0	46.0
Silt, clayey, sandy, carbonaceous, dark gray to black; sand is fine.....	46.0	50.0
Sand, fine to coarse with some fine gravel.....	50.0	55.0
Sand and gravel, fine sand to fine gravel with some medium to coarse gravel.....	55.0	60.0
Silt, clayey, grayish green; contains some interbedded gravel layers.....	60.0	70.0
Gravel, fine to coarse with some sand; contains some limestone pebbles.....	70.0	76.0
Pennsylvanian System - Virgil Series - Shawnee Group:		
Topeka Formation:		
Limestone, light gray to brown.....	76.0	84.0
Shale, light gray to white, very calcareous.....	84.0	86.6
Limestone, light gray to white.....	86.6	87.2
	87.2	90.0

Test Hole #28-B-46  
(A11-8-14dc)  
Lancaster County

Location: SE SW SE sec. 14, T. 11 N., R. 8 E., approximately 9 feet north and 1,855 feet west of the southeast corner.  
Ground elevation: 1,172.0 ft. (a). (Greenwood 7.5 min. quadrangle)  
Depth to water: 49.0 ft. (7-6-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, dark brown.....	0.0	1.0
Clay, silty, light brown to gray.....	1.0	2.0
Silt, clayey, light brownish buff; light grayish buff below 10 ft.....	2.0	16.0
Clay, silty, medium dark brownish gray, light brown with pinkish tint from 18 to 20 ft., light grayish brown below 20 ft.....	16.0	23.0
Silt, clayey, light gray; contains some limonitic fragments below 40 ft., medium brownish gray from 54.5 to 57 ft.....	23.0	69.8
Sand, fine to coarse with some fine gravel, iron stained.....	69.8	74.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud Member:		
Shale, medium gray, clayey; medium to dark gray below 77.3 ft; contains thin limy layers at 77.3, and 78 to 78.1 ft.....	74.5	81.4
Shale, medium gray, limy.....	81.4	81.7
Shale, dark gray.....	81.7	85.6
Howard Formation:		
Limestone, dark gray.....	85.6	85.9
Shale, dark gray.....	85.9	86.9
Limestone, light gray.....	86.9	90.8
Shale, light gray, clayey, very calcareous.....	90.8	91.7
Limestone, medium to dark gray; light gray below 92.5 ft.....	91.7	92.7
Severy Formation:		
Shale, light gray.....	92.7	93.3
Shale, black; light gray from 94.5 to 95.7 ft.....	93.3	97.0
Shale, medium to dark gray.....	97.0	97.4
Shawnee Group:		
Topeka Formation:		
Coal Creek Member:		
Limestone, medium gray.....	97.4	97.7

Test Hole #26-B-46  
(A11-8-15da)  
Lancaster County

Location: NE NE SE sec. 15, T. 11 N., R. 8 E., approximately 2,485 feet north and 7 feet west of the southeast corner.  
Ground elevation: 1,120.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 17.4 ft. (6-27-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, black.....	0.0	3.0
Clay, silty, dark gray to brown.....	3.0	4.0
Silt, clayey, light grayish buff.....	4.0	19.0
Silt, clayey, medium brown.....	19.0	21.0
Sand, silty, to sandy silt, yellowish brown; sand is fine with a few coarser grains.....	21.0	25.0
Sand, silty; sand is fine to coarse.....	25.0	27.5
Silt, clayey, light brown to gray.....	27.5	30.0
Clay, silty, light gray.....	30.0	37.0
Sand, fine to coarse with some fine gravel; contains more gravel below 40 ft.....	37.0	46.0
Clay, silty, light gray with some brownish yellow and bluish gray.....	46.0	50.0
Clay, silty, light greenish gray to bluish gray.....	50.0	55.0
Silt, clayey, light brownish gray.....	55.0	61.0
Sand, fine to coarse with some fine to coarse gravel	61.0	66.0
Pennsylvanian System - Virgil Series - Shawnee Group:		
Topeka Formation:		
Jones Point Member:		
Shale, yellowish brown to gray, clayey.....	66.0	67.5
Shale, dark red, silty, clayey, reddish brown below 70 ft.....	67.5	71.0
Shale, light gray, clayey.....	71.0	72.0
Curzon Member:		
Limestone, light gray; contains shaly limestone below 77.5 ft.....	72.0	78.0
Calhoun Formation:		
Shale, medium gray, clayey.....	78.0	79.5
Deer Creek Formation:		
Ervine Creek Member:		
Limestone, light gray to white; cherty from 80.3 to 80.5 ft., grayish white to brown below 82 ft.....	79.5	83.0

Test Hole #27-B-46  
(A11-8-15ab)  
Lancaster County

Location: SW corner NW NE sec. 15, T. 11 N., R. 8 E., approximately  
1,000 feet south and 2,630 feet west of the northeast corner.  
Ground elevation: 1,120.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 14.8 ft. (6-29-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.0
Soil, clay, silty, dark brown.....	1.0	2.5
Silt, clayey, light brown to gray; contains a trace of shells and limy concretions below 5 ft.....	2.5	10.0
Silt, clayey, grayish buff.....	10.0	18.0
Silt, sandy, medium to dark brown; contains some limonitic grains.....	18.0	20.0
Sand, in part silty; sand is fine to coarse.....	20.0	28.0
Silt, clayey, sandy, dark gray.....	28.0	32.5
Silt, sandy, grayish green; sand is fine.....	32.5	35.0
Sand, fine to coarse with some fine gravel.....	35.0	40.0
Sand and gravel, fine sand to fine gravel with some medium gravel; contains thin gray sandy clay layers at 43.6 and 47 ft.....	40.0	48.0
Clay, silty, light gray; dark gray below 50 ft.....	48.0	58.0
Silt, slightly clayey, sandy, light greenish gray; sand is fine to medium.....	58.0	60.0
Sand, fine to coarse with some fine to medium gravel	60.0	70.0
Sand and gravel, fine sand to medium gravel with some coarse gravel.....	70.0	72.0
Silt, clayey, grayish green and yellowish brown; contains some medium gray below 75 ft.....	72.0	80.0
Silt, clayey, slightly calcareous, medium gray; contains some dark shale fragments below 95 ft....	80.0	99.0
Sand, fine to coarse with some fine gravel.....	99.0	103.0
Sand and gravel, fine sand to medium gravel; con- tains mostly coarse gravel consisting of limestone grains below 105 ft.....	103.0	108.5
Pennsylvanian System - Virgil Series - Shawnee Group:		
Tecumseh Formation:		
Rakes Creek Member:		
Shale, light greenish gray, silty, sandy, calcar- eous; sand is fine grained; contains some indur- ated layers below 115 ft.....	108.5	128.0
Shale, red, clayey, calcareous.....	128.0	137.0
Ost Member:		
Limestone, light gray to green.....	137.0	141.5
Kenoska Member:		
Shale, light gray to yellow, calcareous.....	141.5	142.0

Lecompton Formation:

Avoca Member:

Limestone, light gray.....	142.0	142.8
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King Hill Member:

Shale, red, clayey, silty; contains some gray shale below 150 ft.....	142.8	153.5
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Beil Member:

Limestone, light gray.....	153.5	155.3
Shale, light blue to greenish gray, limy.....	155.3	157.0
Limestone, light greenish gray.....	157.0	157.5

Test Hole #9-B-49  
(A11-8-18bb)  
Lancaster County

Location: NW corner sec. 18, T. 11 N., R. 8 E., approximately 58 feet south and 39 feet east of the northwest corner.  
Ground elevation: 1,119.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 5.4 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, moderately clayey, dark brown to black, very clayey below 4 ft.....	0.0	6.0
Silt, slightly clayey, light buff gray with limonitic stain, moderately clayey below 8 ft; contains some light gray.....	6.0	14.0
Clay, silty, medium brown; granular textured; contains some brownish gray below 17 ft.....	14.0	20.0
Silt, slightly clayey, coarse textured, dark brown..	20.0	26.5
Silt, slightly clayey, dark brown to black, moderately clayey below 31 ft., dark gray below 32 ft..	26.5	33.0
Silt, slightly clayey, light gray; contains some limonitic stain; very sandy; sand is very fine to fine below 35 ft.....	33.0	36.0
Sand, very fine to coarse; sand is very fine to fine below 40 ft.....	36.0	45.5
Silt, clayey, sandy, slightly calcareous, dark grayish green, moderately calcareous from 50 to 55 ft; contains some very fine sand below 50 ft.....	45.5	60.0
Clay, silty, slightly calcareous, medium gray; contains some very fine sand and limy nodules.....	60.0	62.5
Silt, clayey, slightly calcareous, dark brown to black.....	62.5	67.0
Silt, clayey, slightly calcareous, medium gray; contains some limy nodules, moderately calcareous from 70 to 72.5 ft; sandy; sand is very fine below 72.5 ft.....	67.0	75.0
Sand, very fine; contains some limy grains and reworked sandstone.....	75.0	80.0
Sand, medium, with some fine to coarse; contains some pebbles and limy nodules.....	80.0	85.0
Sand, coarse to very coarse with some pebbles and limy nodules; contains a thin siltstone lens at 85 ft.....	85.0	90.0
Pennsylvanian System - Virgil Series - Shawnee Group:		
Shale, clayey, moderately calcareous; contains thin limestone lenses at 95 and 96 ft.....	90.0	97.0
Limestone, light gray.....	97.0	100.0

Test Hole #7-B-49  
(A11-8-31bc)  
Lancaster County

Location: NW SW NW sec. 31, T. 11 N., R. 8 E., approximately 1,859 feet south and 29 feet east of the northwest corner.  
Ground elevation: 1,189.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 45.7 ft. (7-2-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, dark brown to black.....	0.0	1.5
Silt, clayey, dark brown, medium brown below 2.5 ft.	1.5	15.0
Silt, clayey to sandy, dark tannish brown; sand is medium.....	15.0	20.0
Till, clayey, silty, sandy to pebbly, yellowish brown.....	20.0	23.0
Till, clay, silty, sandy, tannish buff, slightly pebble below 25 ft.....	23.0	30.0
Sand, silty, slightly pebbly; sand is fine to medium; sand is very fine and contains no pebbles from 33.5 to 35 ft; sand is slightly silty below 35 ft; sand is medium from 35 to 37.5 ft; sand is medium to coarse below 40 ft.....	30.0	45.0
Till, clayey, silty, slightly sandy to pebbly, tannish gray.....	45.0	50.0
Silt, slightly calcareous, light gray; contains a few pebbles.....	50.0	70.0
Silt, clayey, slightly calcareous, pebbly, light tannish gray; contains some weathered material....	70.0	75.0
Silt, clayey, slightly calcareous, light gray.....	75.0	81.0
Sand and gravel, medium sand to fine gravel with some pebbles; contains a silt layer from 84 to 84.5 ft.....	81.0	85.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, fine to medium; contains a sandstone lens from 119.5 to 119.9 ft.....	85.5	120.0
Ironstone.....	120.0	125.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud Member:		
Shale, black.....	125.0	128.0
Shale, greenish gray, clayey.....	128.0	130.0
Shale, dark reddish brown to red, clayey; contains limestone layers at 136.5 and 138.5 ft.....	130.0	147.0
Shale, dark gray to black, clayey.....	147.0	160.0
Shale, medium gray, clayey, slightly calcareous.....	160.0	184.5
Limestone, medium gray.....	184.5	185.0

Test Hole #1-A-68  
(11-8-35cb)  
Lancaster County

Location: SW NW SW sec. 35, T. 11 N., R. 8 E., approximately 1,357.5 feet north and 7 feet east of southwest corner.  
Ground elevation: 1,232.0 ft. (t). (Waverly 7.5 min. quadrangle)  
Depth to water: 25.48 ft. (6-17-68).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Roadfill.....	0.0	1.0
Silt, slightly clayey, slightly sandy, dark grayish brown; sand is very fine; dark brown below 2 ft...	1.0	4.0
Silt, slightly clayey, slightly sandy, pale brown; sand is very fine, some dark and yellow stain.....	4.0	5.0
Silt, slightly clayey, pale yellow.....	5.0	6.5
Silt, slightly clayey, light yellowish brown, slight yellow stain.....	6.5	10.0
Silt, slightly clayey, pale brown; slight reddish tint, slight yellow stain below 11 ft.....	10.0	11.5
Silt, slightly clayey, slightly sandy, reddish brown; sand is very fine to fine, some yellow stain, moderately clayey below 14 ft.....	11.5	15.2
Silt, moderately clayey, slightly sandy, light yellowish gray; sand is very fine to fine, some yellow stain.....	15.2	16.5
Silt, moderately clayey, slightly sandy, very light brownish gray, sand is fine to medium; very clayey, less yellow stain below 17.8 ft.....	16.5	18.0
Till (?), clay, sandy, slightly calcareous, very light brownish gray, little yellowish brown; trace of secondary lime below 20 ft.....	18.0	23.6
Till (?), silt, moderately clayey, slightly calcareous, light medium brownish gray; some sand grains, trace of secondary lime; light brownish gray with a little mottled yellowish brown below 25 ft.....	23.6	27.7
Till, silt, moderately clayey, sandy, slightly calcareous, light brownish gray.....	27.7	33.7
Till, clay, silty, sandy, slightly calcareous, light brownish gray; brownish gray below 34 ft....	33.7	38.0
Silt, slightly clayey, slightly calcareous, pale olive; some yellow stain in places.....	38.0	56.0
Clay, silty, slightly calcareous, dark gray; light gray with yellow stain below 57 ft.....	56.0	61.2
Clay, silty, slightly calcareous, dark gray, some yellow stain; some light gray below 61.6 ft.....	61.2	61.8
Silt, moderately clayey, slightly sandy, slightly calcareous, brownish gray.....	61.8	62.8



Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Silt, yellowish brown with yellow stain, very sandy, slightly clayey; sand is very fine to fine.....	62.8	65.5
Sand, very silty, slightly clayey; sand is very fine to fine with a trace of medium.....	65.5	67.1
Sand, very silty; sand is very fine to fine, yellow stain.....	67.1	68.0
Silt, light brownish gray, very sandy; sand is very fine to fine.....	68.0	69.0
Sand, very silty; sand is very fine to fine; very fine to medium below 70 ft; some ironstone fragments.....	69.0	79.0
Silt, grayish brown, very sandy, very silty; sand is very fine to medium.....	79.0	79.5
Sandstone, very fine to medium, some ironstone.....	79.5	103.0
Sandstone, sand is very fine to coarse; some very coarse sand from 105 to 108 ft; some fine gravel below 108 ft.....	103.0	115.0
Sandstone, sand is very fine to medium, some coarse.	115.0	120.3
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
Cedarvale - White Cloud Members:		
Shale, pale yellow.....	120.3	120.9
Shale, pale red mottled with greenish gray.....	120.9	137.0
Shale, light to dark gray.....	137.0	177.7
Limestone, light to dark gray, impure.....	177.7	178.6
Shale, light to medium gray.....	178.6	183.2
Howard Formation:		
Limestone, dark gray, very fine to finely crystalline; contains crinoids, fusulinids, brachiopods and much interbedded light greenish gray shale....	183.2	191.7
Shale, light greenish gray.....	191.7	192.2
Limestone, light greenish gray, very finely crystalline; contains fusulinids.....	192.2	192.7
Severy Formation:		
Shale, light greenish gray.....	192.7	193.5
Shale, black, carbonaceous.....	193.5	194.3
Shale, light greenish gray.....	194.3	196.0
Shale, black, carbonaceous.....	196.0	196.9
Limestone, dark gray, impure.....	196.9	197.1
Shale, light to medium gray.....	197.1	202.6
Shawnee Group:		
Topeka Formation:		
Coal Creek Member:		
Limestone, medium to dark gray, very finely crystalline; contains crinoids and brachiopods.....	202.6	203.6

Test Hole #6-B-48  
(A12-5-3aa)  
Lancaster County

Location: NE NE NE sec. 3, T. 12 N., R. 5 E., approximately 8 feet south and 440 feet west of the northeast corner.  
Ground elevation: 1,385.0 ft. (t). (Valparaiso 7.5 min. quadrangle)  
Depth to water: 35.2 ft. (6-29-48).

Depth, in feet  
From To

Quaternary System, undifferentiated:

Fill.....	0.0	0.5
Soil, silt, dark brownish gray.....	0.5	2.0
Silt, slightly clayey, brownish buff.....	2.0	3.0
Silt, clayey, slightly sandy, reddish brown.....	3.0	4.0
Till, clayey, sandy to gravelly with some pebbles, yellowish brown with grayish tint; calcareous below 5 ft.....	4.0	14.5
Gravel, fine to coarse with a little sand.....	14.5	16.0
Till, clayey, sandy to gravelly and pebbly, light gray and yellowish brown.....	16.0	30.0
Sand, fine to medium; contains some yellowish brown silt layers; contains much iron stain below 35 ft.	30.0	38.0
Silt, slightly calcareous, in part sandy and clayey light gray; sand is very fine.....	38.0	46.0
Silt, clayey, sandy, moderately calcareous, medium to dark gray; sand is fine to coarse; contains a few limy fragments below 55 ft.....	46.0	74.0
Sand and gravel, medium sand to medium gravel.....	74.0	76.0
Till, clay, sandy to gravelly, moderately calcareous, medium to dark gray.....	76.0	99.0
Silt, clayey, slightly sandy, slightly calcareous, light grayish green.....	99.0	110.0
Till, silty, clayey, sandy to gravelly, medium to dark gray.....	110.0	136.0
Sand, very fine to medium.....	136.0	150.0
Sand, silty; sand is very fine.....	150.0	173.5
Silt, sandy, light gray; sand is very fine.....	173.5	180.0
Silt, slightly clayey, sandy, light gray; sand is very fine; slightly more clayey from 185 to 190 ft.....	180.0	196.0
Sand and gravel, medium sand to fine gravel with a little medium gravel.....	196.0	205.0
Silt, slightly clayey, sandy, light brownish buff; sand is very fine.....	205.0	218.0
Sand, fine to coarse.....	218.0	220.0
Sand and gravel, fine sand to fine gravel with some medium gravel; contains a silt layer from 223 to 224 ft.....	220.0	233.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone to siltstone, interbedded, light gray; sand is very fine; contains a thin black carbonaceous layer from 246 to 247 ft.....	233.0	250.0

Test Hole #3-A-48  
(A12-5-22aa)  
Lancaster County

Location: NE corner sec. 22, T. 12 N., R. 5 E., approximately 8 feet south and 78 feet west of the northeast corner.  
Ground elevation: 1,390.0 ft. (t). (Valparaiso 7.5 min. quadrangle)  
Depth to water: 30.3 ft. (6-3-48).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, dark brownish gray.....	0.0	1.0
Silt, clayey, dark buff brown with slight grayish tint; brownish gray below 1.5 ft.....	1.0	4.5
Silt, slightly clayey, brownish gray with some mottled light gray; contains a few small limy nodules at 4.5 ft; slightly sandy below 15 ft.....	4.5	15.5
Silt, slightly clayey, tannish brown; contains a few scattered sand and gravel grains; contains some reddish brown below 17 ft.....	15.5	20.0
Till, clayey, sandy to pebbly, slightly calcareous yellowish brown; contains many limy pebbles; contains some light gray below 23 ft.....	20.0	40.0
Till, clayey, sandy to gravelly with a few pebbles light gray; contains some yellowish brown stain from 55 to 67 ft; contains some medium to dark gray below 67 ft.....	40.0	88.0
Silt, moderately calcareous, light gray; contains some limy nodules; in part slightly clayey; coarse textured below 90 ft.....	88.0	93.0
Silt, slightly clayey, slightly sandy, moderately calcareous, medium brownish gray; sand is very fine; contains some snail fragments below 105 ft; contains a peaty layer from 105 to 107.5 ft.....	93.0	110.0
Silt, light gray, sandy; sand is very fine; contains a few snail fragments.....	110.0	129.5
Sand and gravel, fine sand to coarse gravel, principally ironstone, limestone, and siltstone...	129.5	133.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, yellow, clayey.....	133.0	135.0
Shale, light gray, clayey.....	135.0	150.0

Test Hole #33-B-46  
(A12-7-36ad)  
Lancaster County

Location: SE corner NE sec. 36, T. 12 N., R. 7 E., approximately  
2,568 feet south and 8 feet west of the northeast corner.  
Ground elevation: 1,188.0 ft. (a). (Waverly 7.5 min. quadrangle)  
Depth to water: 28.5 ft. (7-6-46).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil, silt, clayey, dark brownish gray.....	0.0	2.5
Silt, clayey, light gray to brown with limonitic stain; contains some limonitic rootlets below 10 ft.....	2.5	16.0
Silt, clayey, medium brown to pink; sandy below 18 ft.....	16.0	21.0
Silt, clayey, sandy, yellowish orange to gray; sand is fine; contains a few gravel grains below 25 ft.....	21.0	30.0
Sand, silty; sand is very fine; contains a light gray silt layer from 34 to 35 ft.....	30.0	43.5
Silt, clayey, light gray; contains some dark brown below 51 ft.....	43.5	55.0
Clay, medium bluish gray to light gray.....	55.0	58.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sandstone, fine grained, iron stained; sand is fine to medium below 80 ft.....	58.0	85.0
Ironstone.....	85.0	85.1
Clay, light gray to white, sandy.....	85.1	87.5
Sandstone, sand is fine to medium with some coarse; contains an ironstone lens at 87.5 ft.....	87.5	94.0
Sandstone, fine grained; sand is fine to medium with some coarse below 100 ft.....	94.0	105.0
Sandstone, sand is fine to coarse with some coarser grains; iron cemented below 115 ft.....	105.0	116.5
Sandstone, sand is fine to medium with some coarse; contains more coarse sand from 120 to 125 ft; contains some coarser grains from 125 to 128 ft.....	116.5	135.0
Sandstone, fine to coarse grained; contains a yellowish clay layer from 147.3 to 147.5 ft.....	135.0	149.0
Sand and gravel, light brownish gray; fine sand to fine gravel; contains many reworked limestone pebbles.....	149.0	155.0
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud Member:		
Shale, red and yellow, clayey.....	155.0	157.0
Shale, medium to dark gray, clayey.....	157.0	165.6
Limestone, dark gray, shaly.....	165.6	166.8
Shale, dark gray; medium gray below 170 ft.....	166.8	173.0

Howard Formation:

Limestone, light gray, shaly.....	173.0	173.7
Shale, medium gray, clayey.....	173.7	175.3
Limestone, medium to dark gray, shaly.....	175.3	178.0
Limestone, light gray; contains shale and shaly limestone from 182 to 183.2 ft.....	178.0	183.6

Severy Formation:

Shale, black, clayey; light gray from 186 to 187 ft.	183.6	188.5
Shale, medium gray, clayey; medium to dark gray from 189.1 to 191.1 ft; light gray below 191.1 ft.....	188.5	191.5

Test Hole #72-A-49  
(A12-8-6bb)  
Location County

Location: NW NW NW sec. 6, T. 12 N., R. 8 E., approximately 129 feet south and 7 feet east of the northwest corner.  
Ground elevation: 1,142.0 ft. (a). (Wahoo SE 7.5 min. quadrangle)  
Depth to water: Artesian flow (11-29-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	0.6
Soil, silt, clayey, black.....	0.6	5.0
Silt, slightly clayey, dark gray.....	5.0	10.0
Silt, slightly clayey, light olive green.....	10.0	15.0
Silt, slightly clayey, dark bluish green; slightly lighter color below 24 ft.....	15.0	30.0
Silt, slightly clayey, slightly sandy, moderately calcareous, medium gray; sand is very fine; contains many snails.....	30.0	39.0
Sand, medium to coarse.....	39.0	40.0
Sand and gravel, medium sand to fine gravel with a little medium gravel.....	40.0	45.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, light yellowish gray to light gray, clayey to sandy.....	45.0	50.0
Shale, medium gray, sandy, slightly clayey.....	50.0	95.0
Shale, light gray, silty, sandy; sand is very fine; yellowish brown to yellow below 112.5 ft.....	95.0	120.0
Silt, light gray, sandy; sand is very fine to fine..	120.0	129.0
Sandstone, very fine grained.....	129.0	140.0
Sandstone, sand is very fine to fine with some medium; contains some fine gravel below 147 ft....	140.0	159.5
Silt, yellowish brown to gray, slightly clayey, sandy; sand is very fine to medium.....	159.5	167.0
No sample, possibly ironstone or limestone.....	167.0	167.2

Test Hole #71-A-49  
(A12-8-18cc)  
Lancaster County

Location: SW SW SW sec. 18, T. 12 N., R. 8 E., approximately 173 feet north and 6 feet east of the southwest corner.  
Ground elevation: 1.205.0 ft. (t). (Wahoo SE 7.5 min. quadrangle)  
Depth to water: 33.0 ft. (11-29-49).

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil.....	0.0	1.5
Silt, clayey, dark brown; granular textured.....	1.5	3.0
Silt, slightly clayey, light brown; slightly sandy below 10 ft; sand is very fine to medium.....	3.0	18.5
Silt, slightly clayey, light red; slightly sandy below 22 ft; light brown; sand is very fine.....	18.5	31.0
Silt, slightly clayey, grayish brown; contains a soil layer from 31 to 32 ft., light gray, slightly sandy; sand is very fine below 35 ft.....	31.0	46.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, mottled grayish white to reddish brown, clayey, slightly sandy; sand is very fine.....	46.0	107.0
Silt, light gray, slightly clayey, sandy; sand is very fine to fine; gray to yellowish brown from 110 to 111.5 ft; light gray to blue below 111.5 ft.....	107.0	113.0
Shale, light gray to black, clayey, slightly sandy; sand is very fine; light gray from 120 to 128 ft; sand is very fine to medium below 130 ft.....		
Sand, slightly silty; sand is very fine to medium; contains some sandy shale from 136 to 140 ft; sand is very fine to coarse below 140 ft.....	131.5	145.5
Pennsylvanian System - Virgil Series - Wabaunsee Group:		
Scranton Formation:		
White Cloud Member:		
Shale, dark reddish brown; contains some green and yellowish brown below 150 ft.....	145.5	157.0
Shale, light bluish gray, silty.....	157.0	180.0